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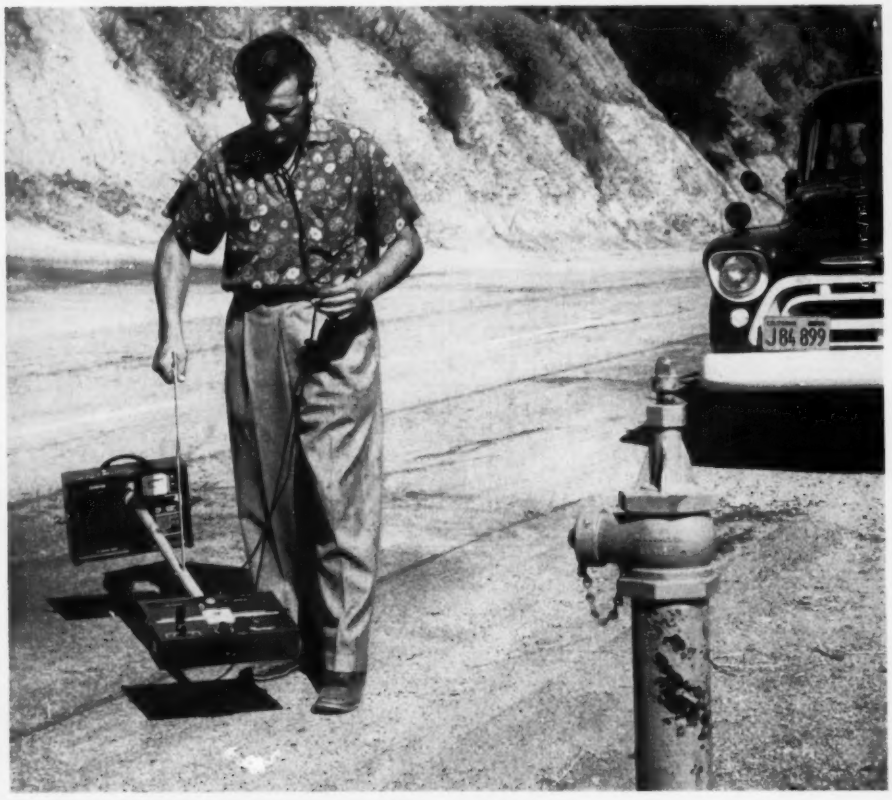
Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



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ELECTRONICS SECTION — Page 21

"EARTH SEARCHERS"

Wilmer Burtness of General Telephone Co. of California, with pipe locator searches for underground pipes for grounding purposes. Story on page 19.

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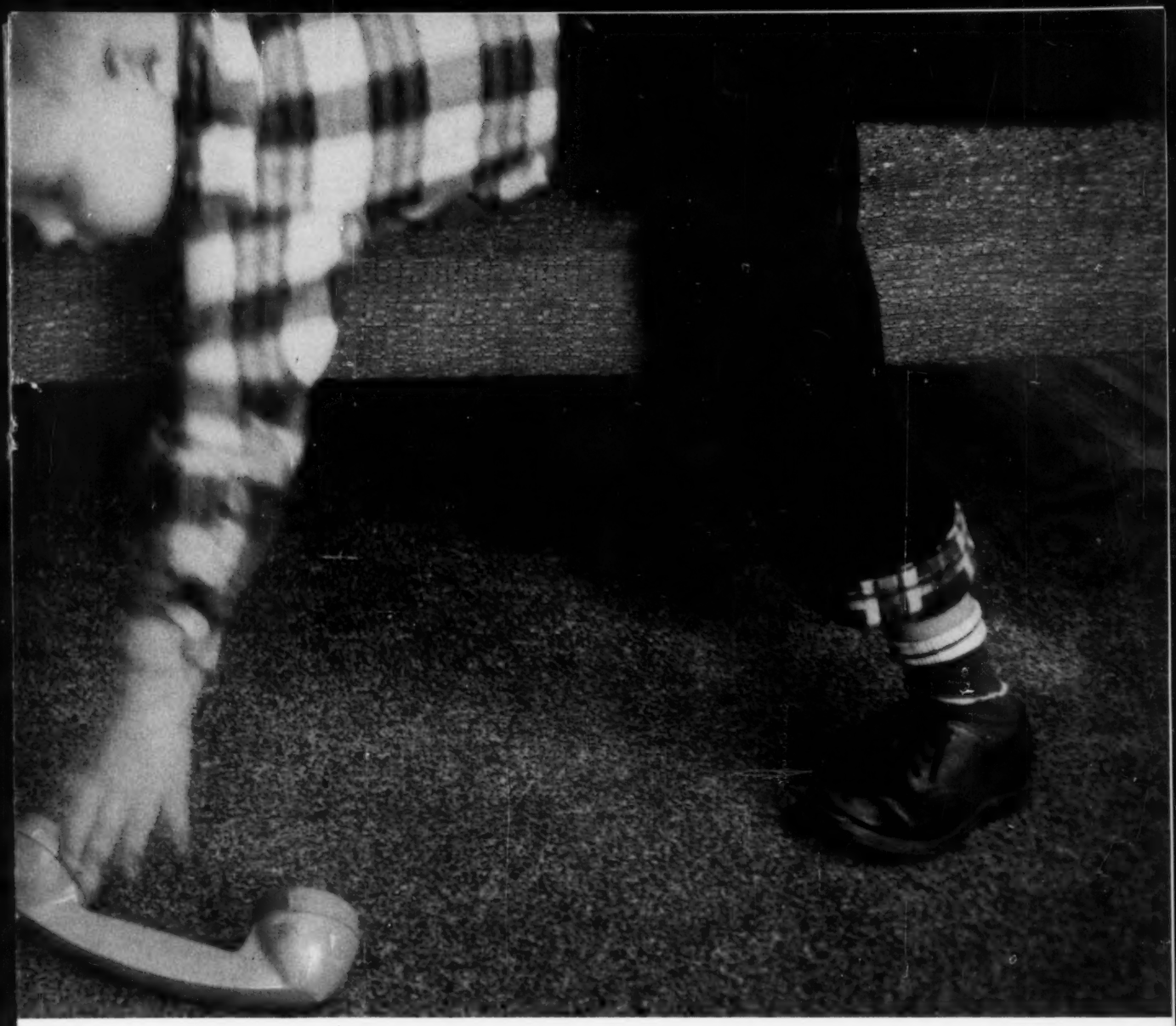

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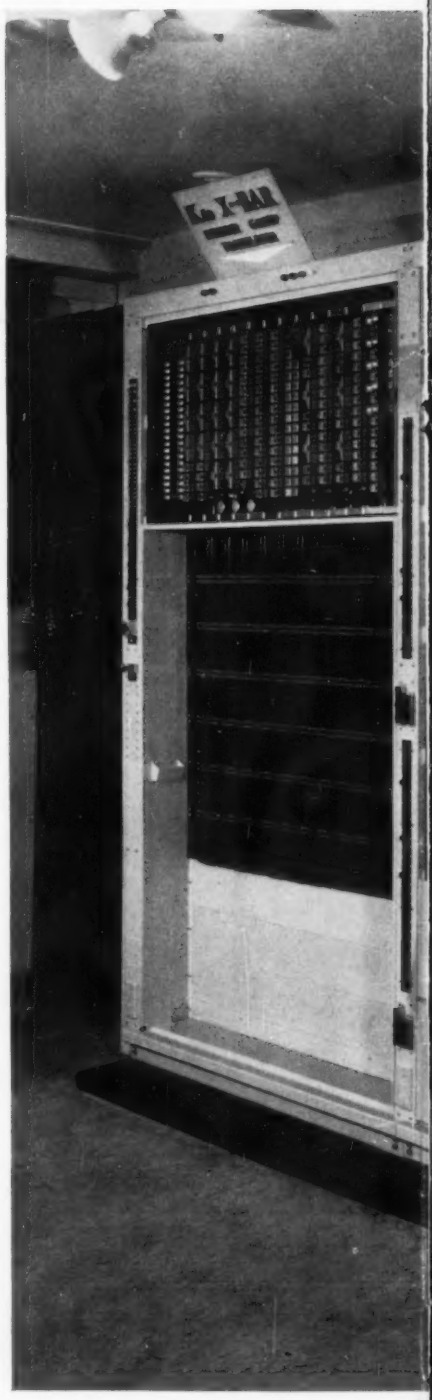

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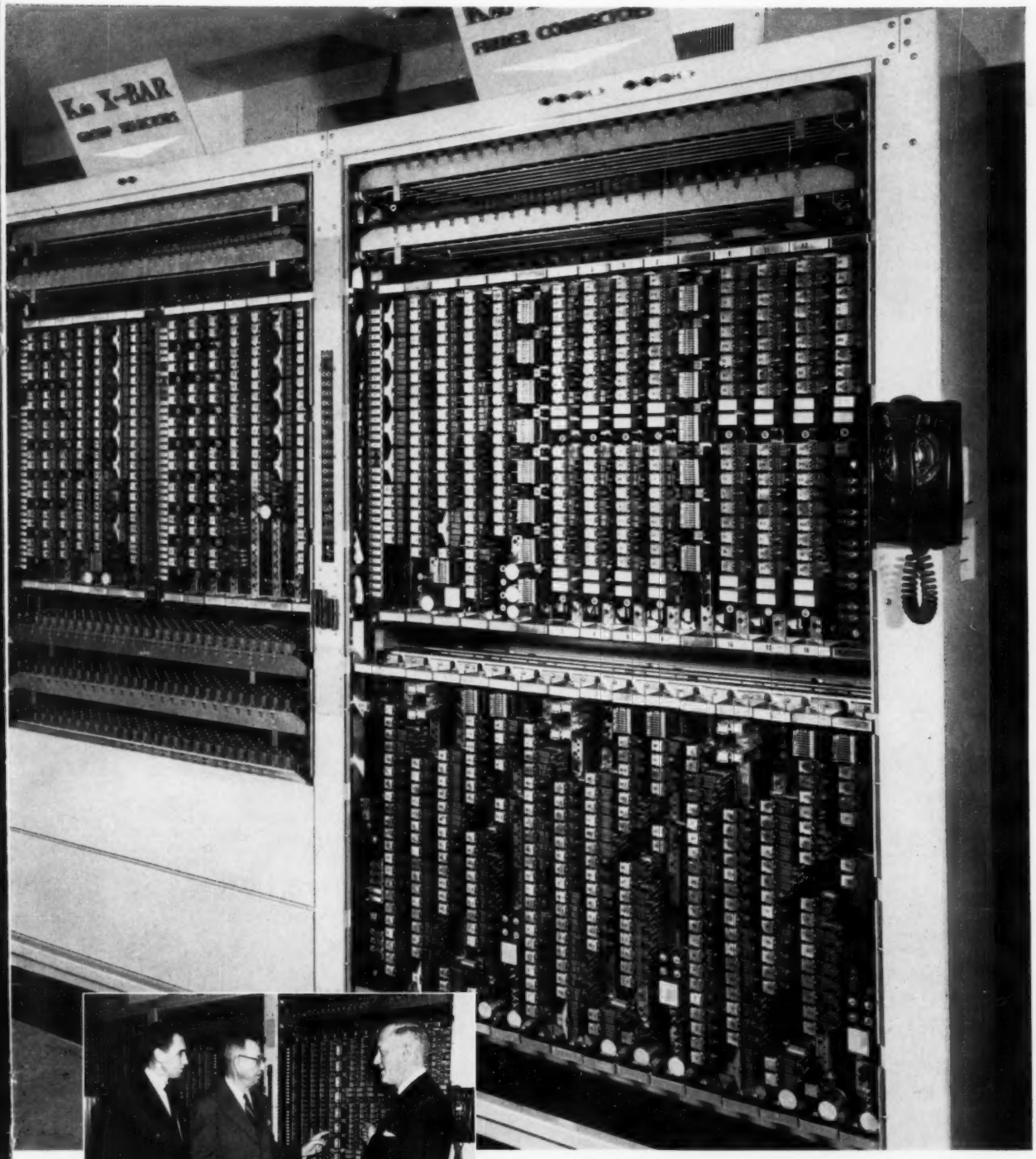

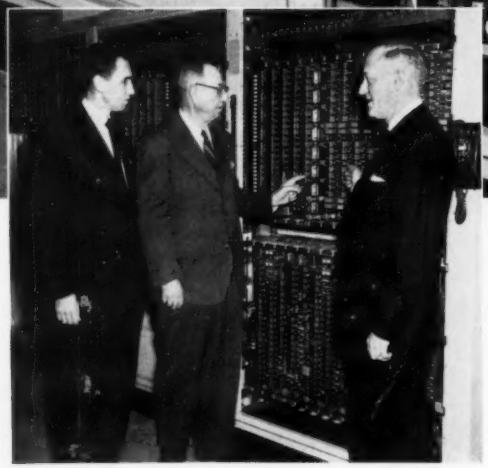

The K-60 Crossbar Switching System was introduced in this display at the U.S.I.T.A. Convention. This new unit reduces floor space requirements of previous crossbar equipment by 30%.

Among many distinguished visitors expressing interest in the new K-60 was Mr. S. A. "Gus" Lane, President of the Western Arkansas Telephone Company, Russellville, Arkansas. Mr. Lane (center) was shown the systems' many outstanding features by G. T. Scharffenberger (left), President, and W. P. Hollis, Vice President, of Kellogg Switchboard and Supply Company.

FLASHES AND PLUGS

DON'T SQUEEZE THE CHEESE! The nearsighted telephone operator was doing her daily marketing. Hesistantly she approached a clerk in the local supermarket. Squinting, she pointed out to him a round object on a distant counter.

"Is that the head cheese?" she asked.

"No, ma'am," replied the clerk, slightly nonplused, "that's his assistant."

•

CONCISE COMMENTARY. A management consultant had just been drafted into the army. He finished his physical and was being questioned by a sergeant who asked: "Did you go to grammar school?"

"Yes, sir, he said, and anxious to make a good impression went on, "I also went through high school, graduated cum laude from college, completed three years of graduate studies and then studied two years at Harvard, two at Yale and two more at Princeton."

The sergeant nodded, reached for a rubber stamp and slapped it on the questionnaire. It consisted of one word: "LITERATE"!

•

LONG LIFE, NO STRIFE. "Yes, sir," said the retired telephone man, "I'll be 90 tomorrow, and I haven't an enemy in the world."

"A beautiful thought," said his visitor.

"Yes, sir," went on the old man, "I've outlived them all."

•

TAX INVASION. Inhabitants of Gomera, one of the Canary Islands, have used a unique method of communication for generations.

The island, a Spanish possession, is furrowed with deep gorges which the people talk across by whistling. The whistle codes developed into a whistle language—with many tones and inflections.

Until fairly recently, Gomera natives paid taxes only when it pleased them to do so. A warning of the tax-collector's arrival was whistled throughout the island as soon as he landed and frequently he was forced to return empty-handed to the boat that had brought him.

•

BIFOCALS, YET! The Texas oilman, barreling along the highway in an expensive new car, screeched to a halt to pick up a hitchhiker. As he was climbing in, the young man noticed a pair of thick-lensed glasses lying on the car seat.

As the telephone poles flew by in a blur, the rider grew panicky.

"Beg pardon, mister," the hitchhiker finally ventured, "but don't you think you ought to wear your glasses while you're driving?"

"Shucks, son, don't let that bother you," the Texan drawled. "This here windshield is ground to my prescription."

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

May 31, 1958

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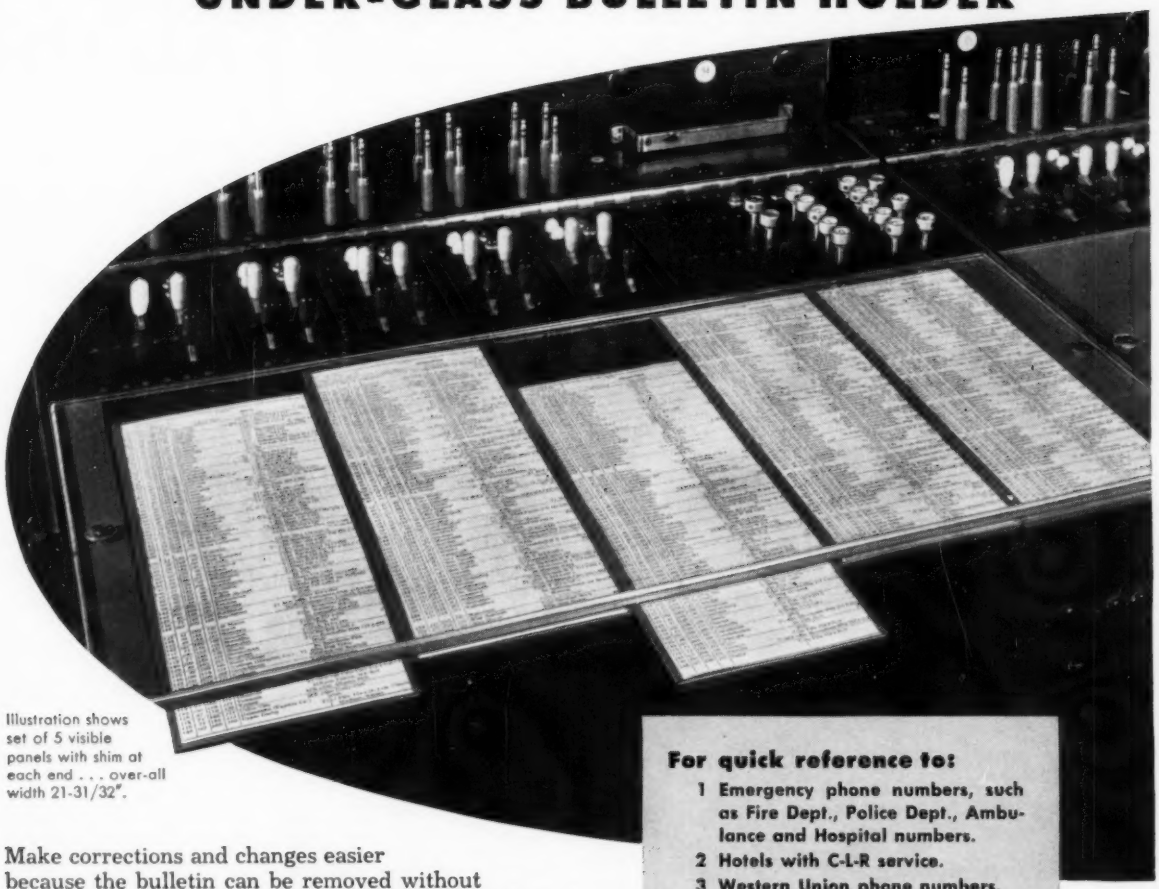

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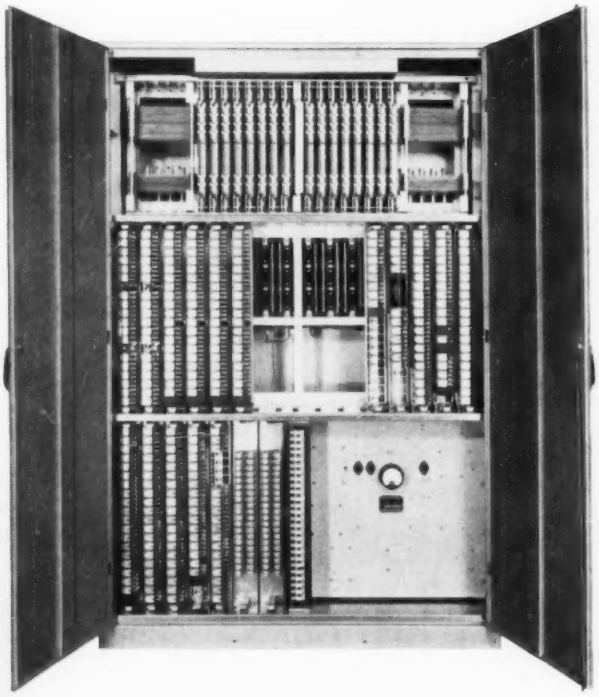

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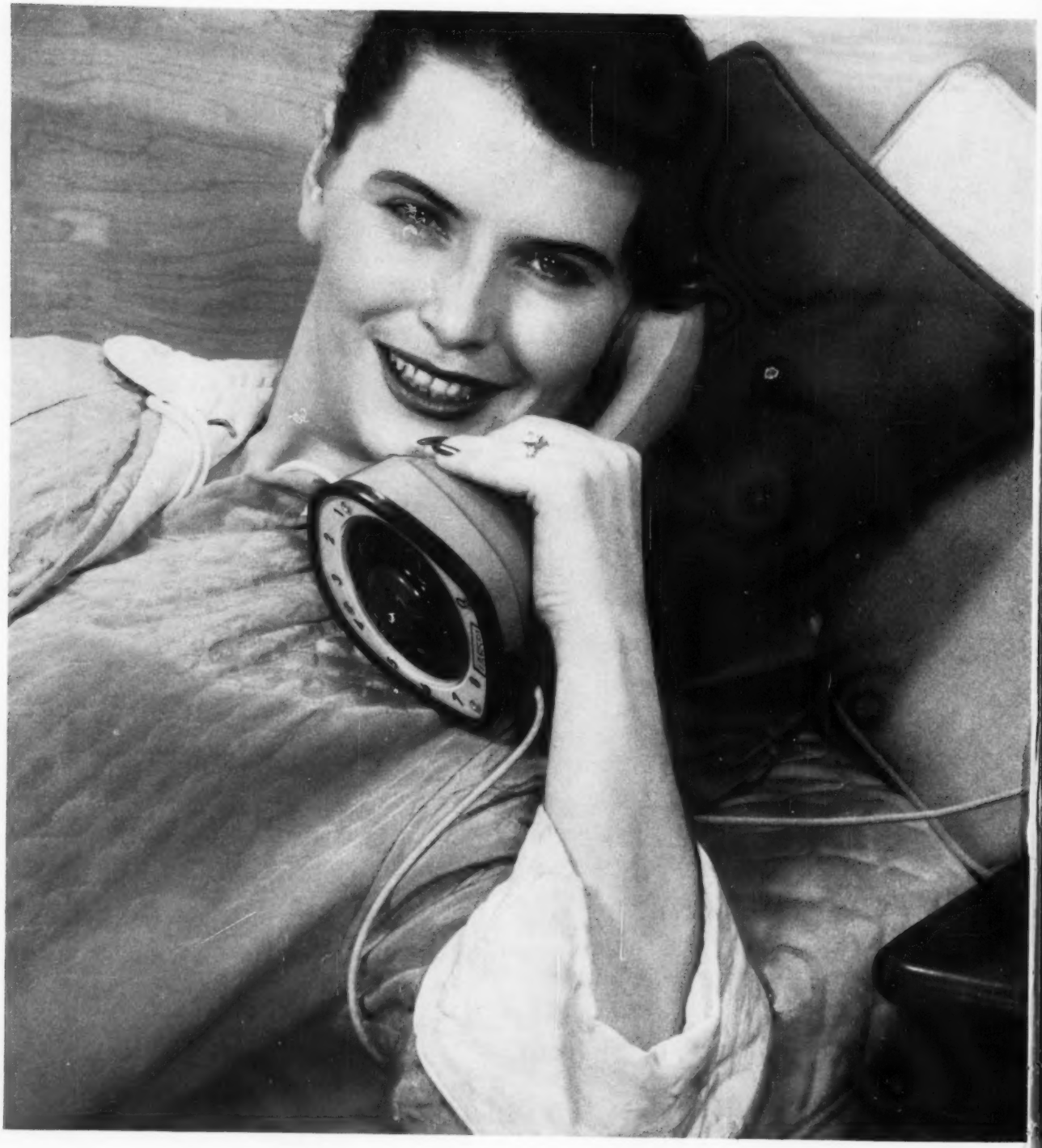

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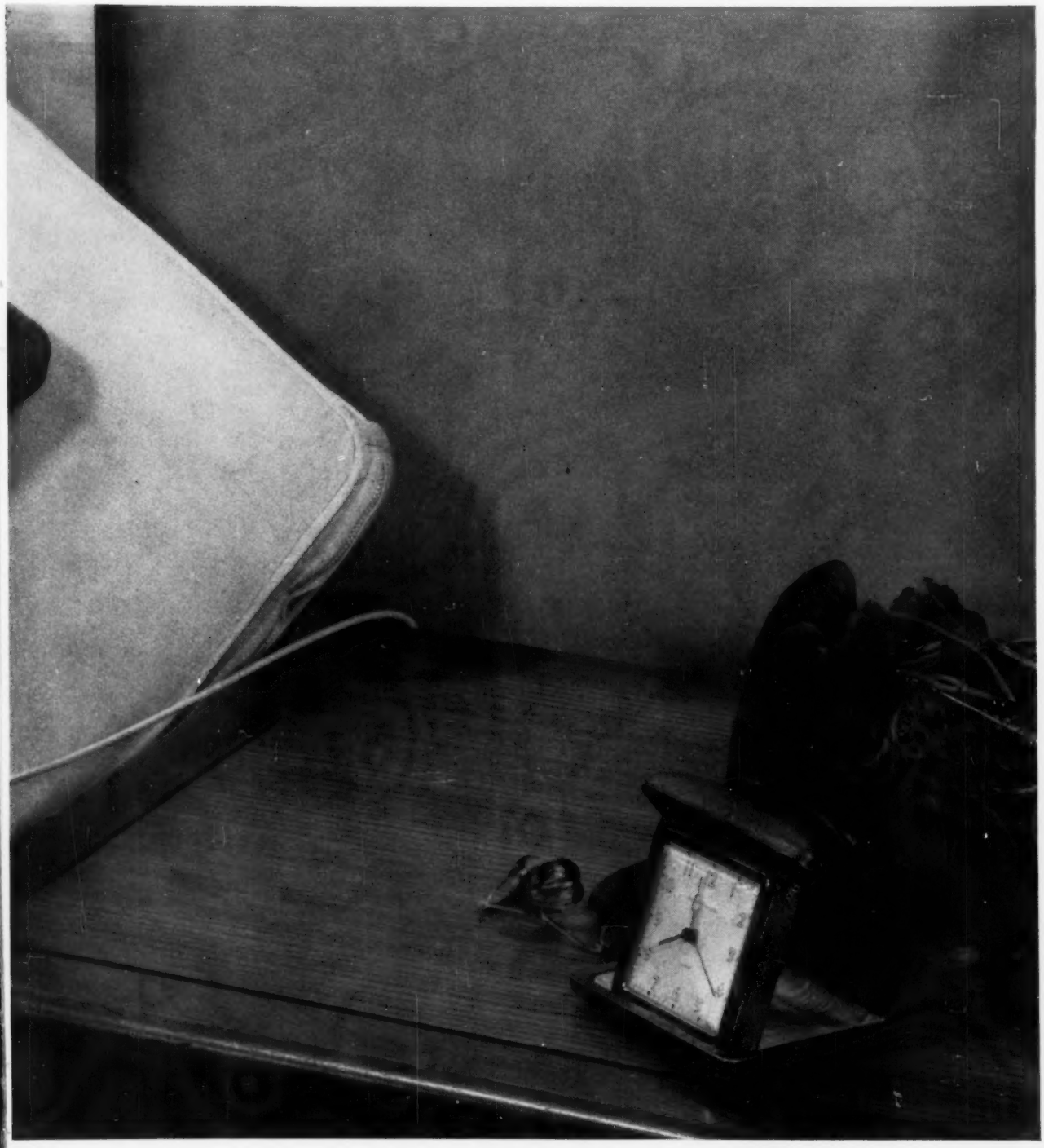

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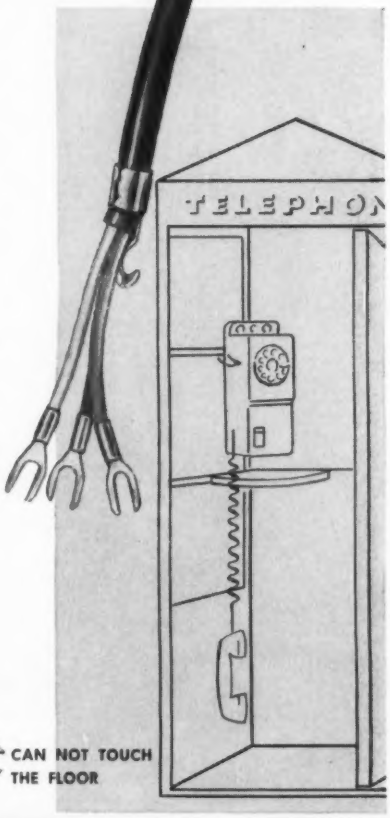

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Apparently not many states are enthusiastic about the idea of turning over to them part of the federal excise taxes on local telephone bills. Celler indicates possibility that Justice Department might try to reopen AT&T-WE consent decree.

IT DOES not appear now that very many states are very enthusiastic about the idea of turning over to them 40 per cent of the federal excise tax on monthly telephone bills, in return for which the states would also take over certain social service responsibilities. Some of the states are beginning to figure out that they would be getting the worst of the bargain, dollarwise. Hence, President Eisenhower's proposals with respect to the federal excise tax on telephone service have so far aroused few cheers in Congress or in the telephone industry.

The President requested legislation, previously suggested in his Budget Message in January, that would repeal present programs of federal financial assistance to states for vocational education and to cities to help them build waste treatment facilities. These programs would henceforth be financed by local governments, partly by virtue of a reduction in the federal excise tax on telephone service from the present 10 per cent to as little as 6 per cent where local taxes are imposed for the two activities. The request carries out a recommendation of a joint federal-state task force set up last year by the President, and is one step in a program to return to the states some spending programs now undertaken by the federal government.

Contrary to this writer's earlier expectation, the present prospects for passage of such legislation are not too bright. The vocational education program, which costs about 50 million dollars a year, has always been a congressional pet. With reference to the waste treatment facility program, which also cost about 50 million dollars a year, a House Public Works Subcommittee has already held hearings to double this amount in the next fiscal year.

A House Government Operations Sub-committee survey also indicates that, if the President's proposals were adopted, about *20 states would obtain less revenue from a 4 per cent tax on telephone service than they now get through federal grants for vocational education and waste treatment facilities.*

From the telephone industry's standpoint, President Eisenhower's proposals are equally unsatisfactory. The position of the United States Independent Telephone Association, as well as of the Bell System, is to obtain repeal of the entire federal excise tax on telephone service. This position is somewhat contrary to the administration's attitude on the subject. It is the argument of the telephone industry that the excise tax was an emergency wartime measure which is no longer necessary and which treats as a luxury what is, in fact, a daily necessity.

The USITA sums up its attitude as follows:

"The necessity of maintaining federal tax revenues at the current high level should not preclude the elimination of the unfair and discriminatory excise tax on communication services. The nature of this tax demands its early repeal.

"Without questioning the Joint Federal-State Action Committee's suggestions for the transfer of certain functions to the states, the proposal that any portion of the federal excise tax on communication services be credited to the states in order to meet the cost of these functions is basically unsound. State responsibility would rest insecurely if supported by a temporary tax and the excise tax on communication services should not be permitted to become permanent."

Consent Decree Reopened?

Testimony last week before the House Anti-trust Sub-committee, headed by Representative Celler (D., N. Y.), suggested the possibility that the Justice Department might try to reopen its consent decree of January, 1956. Under this decree, which has been criticized by the Celler group, the Justice Department agreed to end its suit against the American Telephone & Telegraph Co. originally designed to bring about an absolute divorce between Western Electric and the Bell System. Under terms of that decree Western Electric was permitted to continue as the manufacturing subsidiary of the Bell group.

The hint that the Justice Department itself might ask the U. S. District Court to review the terms of the consent decree came from Victor R. Hansen, assistant attorney general in charge of the Justice Department's anti-trust division. He told the Celler sub-committee that he was "considering the possibility" of seeking modification of the decree. However, it would be quite an unusual move for a subordinate official of the Justice Department to make a complete reversal of policy followed and established by the attorney general —in this case, former Attorney General Herbert Brownell Jr.

What Mr. Hansen probably has in mind is not so much a modification of the consent decree as it is a clarification or interpretation of certain provisions which have come into question. The main difficulty along this line seems to be the definition of so-called "competitive services" or "common carrier" operations. The court might be asked to clarify just what is meant in terms of specific situations in which Bell telephone companies wish to operate.

But, the criticism of Representative Celler concerning the terms of the decree, whereby Western Electric was permitted to go on serving as a manufacturing subsidiary of the Bell System, would seem to go to the heart of the decree. It is this writer's guess

that the Justice Department will not turn around so completely as to ask the court to change a decree which it sought itself in 1956. That would not be a new interpretation. It would be junking the decree entirely. So, no matter how Representative Celler may feel about it, this writer believes that the continuation of the Western Electric operations as part of the Bell System will stand, for a while anyhow.

Hansen disclosed that on Apr. 8 the Justice Department had requested the Bell System to furnish reports on just how AT&T and Western Electric were complying with the terms of the decree. But Representative Celler was not very happy about the cooperation which he says his sub-committee's investigators have been getting (or more correctly, not been getting) from the Justice Department. As to this, Hansen's attitude was that the Justice Department cannot make its files available in response to general requests. He said that requests for specific documents would be given careful attention by the attorney general's office.

Ghost of Walker Probe

An interesting side light on the Celler sub-committee's investigation was thrown on the subject of price comparisons between Western Electric and other telephone manufacturers. On Apr. 22, in questioning the Bell System's attorney, Horace P. Moulton, the sub-committee's counsel, Herbert Maletz, read into the record excerpts on this subject from the old Federal Communications Commission's investigation of the telephone industry in 1936. This so-called Walker investigation (because it was headed by former FCC Commissioner Paul A. Walker) turned up some price comparisons by Cyrus G. Hill, at that time chief engineer of the special FCC investigation staff. This was the same Mr. Hill who was employed by the Justice Department's anti-trust division to assist in investigating Bell System-Western Electric relations prior to filing the government's original anti-trust complaint.

The interesting sidelight is that, way back in 1937, shortly after Hill had introduced price comparison data on Western Electric, he appeared as a witness for the Wisconsin Public Service Commission in a case involving the rates of the Wisconsin Telephone Co. before a lower state court (Dane County). The gist of Hill's testimony was that independent manufacturers' prices were generally somewhat lower than Western's. (FCC Investigation Exhibit 292.) When Hill was asked to produce some working papers supporting the conclusions, he was able to comply only partially. He explained his refusal to produce other supporting data on the basis that they were confidential. On cross-examination he conceded that there were some errors of a substantive character in those papers which he did produce (Circuit Court—Dane County, Vol. 58, p. 85, Feb. 23, 1938).

The result was that the court threw out the testimony as being untrustworthy. The lower court's opinion stated:

"From the whole record on this issue, this court has been forced to the conclusion that the testimony on behalf of the commission and especially that of Mr. Hill is unreliable and is based to a great extent on unreliable witnesses and conjecture. This court is convinced that the plaintiff (Wisconsin Telephone Co.) has clearly shown that the Western Electric prices were lower than comparable prices of independent manufacturers."

Subsequently, the court found, as a matter of fact, that Western Electric's prices from 1925 to 1935 were lower. The Wisconsin commission on appeal did not even attempt to support the contrary position taken by its witnesses.

Later on, the Supreme Court of Wisconsin stated (Wisconsin Telephone Co. *v.* Public Service Commission (1939) 30 PUR NS 65) in its decision that "While we cannot adopt the view of the trial court with respect to the testimony given by the witness Hill in its entirety, a reading of the record convinces us that it is so unfair and biased as to be unreliable."

Yet, this is the evidence which the Celler sub-committee counsel, Herbert Maletz, put into the record of the Western Electric anti-trust investigation on Apr. 22, 1958. It is noteworthy that some of the errors in the Hill study were corrected in the final FCC report on its telephone investigation submitted on June 14, 1939. Other comparisons were omitted from the report.

It is also noteworthy that Mr. Hill, himself, although testifying in a number of Bell System rate cases before state commissions, did not again attempt to use the comparative price data which had been so summarily thrown out of court in the Wisconsin case. Later the same witness in a rate case involving Mountain States Telephone & Telegraph Co. (El Paso City Council in 1942) conceded that his 1936 study would probably no longer prevail because of price reductions made by Western Electric.

If the Celler sub-committee continues to rely on such stale or discredited evidence, its final report will be correspondingly suspect.

Montana Denies Increase

Montana is one of the states where some recognition is supposed to be given, in utility rate cases, to the reproduction cost or present fair value factor. Such has been the requirement of at least three decisions of the Montana Supreme Court directed to the Montana Public Service Commission (a three-man board elected by the voters of that state). But, a recent telephone rate decision in Montana suggests that the actual recognition given by the majority of the commission to the present fair value element is about as substantial as the recognition given by a certain rich uncle to his hopeful nephew, in the former's will. The story goes that the family lawyer, in reading the deceased uncle's will, came to a passage something like this: "To my Nephew Charlie, to whom I have promised for many years that he would be remembered in my will, I now say: 'Hi, Charlie!' "

What happened in Montana was that the Mountain States Telephone & Telegraph Co. has been denied, in full, a requested increase of $3,295,000. The Montana commission action was not unanimous (2 to 1). The rate base used by the majority was called an "average test period fair value base." Plant under construction, property held for future use, materials and supplies, and cash working capital were all disallowed and deducted from this base, *which resulted in a base about 5 per cent below the original cost less depreciation base before disallowances.* Test period results (ending June 30, 1957) were used. Adjustments to reflect annual effect of wage increases granted in December, 1956, and February, 1957, were not permitted. The commission adjusted expenses to eliminate certain property appraisal costs considered to be non-recurring.

A rate of return of 5.56 per cent was held by the Montana commission majority to be just and reasonable, based on a hypothetical debt ratio of 45 per cent, cost of debt 3.61 per cent, cost of equity 6.95 per cent, and over-all cost of capital of 5.44 per cent. A claim for attrition losses was rejected on the basis that increased revenues and operating efficiencies should offset anticipated increases in expenses.

Montana Commissioner Middleton dissented strongly and was of the opinion the increase should have been granted. He criticized the majority opinion for its failure to give due weight to reproduction cost new in the rate base, for not projecting the test period, for deducting cash working capital from the rate base, for omitting effect of attrition, for using a hypothetical debt ratio, and for setting a rate of return he considers confiscatory.

TROUBLE CLEARING

Imagination and Learning

By L. N. MARTIN

"HE WHO seeks to discover must first learn to *imagine* and to deliberate."—*Pythagoras.*

It has been some 25 centuries since the ancient philosopher, mathematician, and teacher spoke those words and *imagination* still is of the greatest importance in learning and teaching.

In our preceeding article, "How Does a Person Learn?" (TELEPHONY Apr. 19, p. 27), we said that the human brain had the power to imagine things that do not exist. That statement could possibly be misunderstood by some of our readers who would at once think of the inebriated gentleman who imagines snakes crawling over his person, or of the traditional ward of the state who imagines that he is Napoleon. Imagination running wild may be bad, but this is far outweighed by the good it does in science, invention, discovery, and learning.

Alexander Graham Bell imagined something that did not exist. He imagined an electric telephone when no such instrument existed anywhere in the world. He then set about in a practical way to create a telephone. The Wright brothers imagined a machine heavier than air that would fly like a bird. Many others had this same dream but the Wrights made it work. An inventor must first of all have a vivid imagination—one that will form a mental picture of something that does not exist, but which would be useful if it did exist. He must then follow up his dream with practical work.

Scientific discoveries often start with imagination. A scientist develops a "theory" which he believes will account for certain observed phenomena. So far, this theory is just a mental picture or imagination. He then puts this theory to the test. It must explain all observed phenomena that pertain to it and no known fact must contradict it.

If, after some years, the theory has not been contradicted, it becomes a generally accepted theory and finally a fully accepted fact. However, if later and more accurate observations do not conform to the theory it must be dropped or revised.

PART 65. The preceding installment in this series appeared in the April 19 issue.

The brain can also imagine things that *do* exist, but which are not immediately present or, which for some reason, cannot be perceived by any of the human senses. Electricity cannot be seen, nor can it be perceived by any of the other senses. To learn about electricity one must use his imagination to form a mental picture of it. Many purely mechanical machines may be fully understood by watching them operate, but this is not true of the telephone, or other electrical equipment.

When this writer was a little boy he was much interested in machinery and most of the machinery to be seen in the rural town in which he lived was farm machinery. He remembers studying a binder. The grain was cut by a sickle bar and conveyed by a broad canvas belt to the top of the machine where it was to be bound. Members which looked like pitch forks packed it into the binding compartment. That much was easy to understand.

When enough grain to make a bundle had been assembled, a long curved needle carrying the binding twine in its eye encircled the wheat or oats. A member which resembled a human hand then seized the twine, cut off the end towards the coil, and deftly tied the two ends together. The bundle was then kicked out and the process started over again.

This was a marvelous and almost human performance which the young boy hardly hoped to understand. However, he continued to study the machine and soon found that it was all done with cams. Each motion was controlled by a separate cam. There were about a half dozen of these cams all mounted on the same shaft.

This shaft was normally motionless, but when enough grain had been accumulated to make a bundle the pressure operated a trigger which caused the shaft to make one revolution. The cams, each cut to a different shape, caused each part of the machine to make the proper motion at the right time. It was now quite clear. It required no imagination to understand this machine. It was all in full view and required only observation and reasoning.

Now, let us examine a piece of telephone equipment, say a carrier terminal. We remove the outer cover and see a maze of equipment and wires, but nothing whatever to tell us how this machine operates. The only moving parts are the armatures of a few relays and these relays are in the auxiliary signaling circuit and have nothing to do with the voice transmission. We try to trace some of the wires but soon find that we would have to tear the equipment apart to do that. Then some one tells us that we should look at a circuit drawing.

We obtain a circuit drawing but it looks nothing like the equipment. We must use our imagination to see the equipment in the drawing. However, we still do not see the various kinds of electric currents that are supposed to be flowing through the wires, which are indicated by black or white lines on the drawing or blue print. Again, we must have imagination to understand this thing.

Many telephone men become excellent mechanics. They can do a bang-up job of setting poles, stringing wire or cable, mounting equipment, even splicing cable. However, they never become "circuit men." They cannot understand "how it works." They cannot learn to line up a carrier or clear trouble on it.

We believe that the reason for this is that they have not developed an "imagination" that can give them a clear

mental picture of that which is unseen and unseeable. Perhaps, their teachers have not understood the value of such an imagination and have not encouraged its development.

Since the telephone business is an electrical industry, we believe that the training of a plant man should start with elementary electricity. Or, if he has studied electricity in school, his company training should start where his school left off. At the same time, his mechanical ability should be developed.

Suppose that a class is to be started in elementary electricity. Since the class is to learn about something that they cannot see or feel, a lot of imagination will be required. Some teachers compare electricity to hydraulics. In many ways, this is very good. The student can visualize water better than he can electricity and, in many ways, these two forces act alike. However, there are many cases in which this comparison will not apply. Why not encourage the student to form a distinctive mental concept of electricity?

Since the electronic theory of current flow is now universally accepted, why not start the student right so that he will not later have to unlearn some of his original concepts? We will try to illustrate.

The student should first be given a very brief course in the composition of matter. He should learn the meaning of molecule, atom, and electron. The extremely small size of these units should be stressed. The student should understand from the first that he cannot hope to see a molecule, an atom, or an electron, but their existance is subject to scientific proof. He should, therefore try, to imagine these things so that he can think about them and study them. We would then proceed somewhat as follows:

Here is a dry cell. It is made of various substances, all of which are made of atoms and each one of these atoms contains a number of electrons. The atoms of each substance differ, i.e., an atom of carbon differs from an atom of zinc, but all electrons are alke, i.e., an electron in an atom of carbon does not differ from an electron which is part of an atom of zinc. The number of electrons in an atom varies with the substance and they are in the outer layer of the atom and revolve around the core or nucleus. An electron may be added to or removed from an atom under certain conditions.

Now, this is what we call the negative pole of the dry cell. It is made of zinc and is terminated in this brass binding post to which a wire may be connected. The chemical action in the cell (which we need not explain at this time) has forced many electrons into the zinc and up into the brass binding post.

We cannot see these electrons, of course, but let us imagine them. There are too many of them. They are crowded and want to escape. Imagine millions and billions of tiny electrons pushing against each other and trying to escape. This creates pressure.

However, this is not a pressure that you can feel, like the pressure of a coiled spring. It is electrical pressure or electrical potential. It is also called "electromotive force" (EMF).

Now, let us look at the positive pole of the cell which is made of carbon and has a binding post like that at the negative pole. Again, we will imagine what we cannot see. The same chemical action that caused a surplus of electrons to go to the zinc has robbed the carbon of some of its electrons.

Let us think of the carbon as full of tiny holes where electrons ought to be. These holes want to be filled. It is much like a vacuum. You know that air will rush in through the smallest crack to fill a vacuum. This force is also called EMF but it is pressing *towards* the carbon. You can already imagine what would happen if the positive and negative poles were joined by a path over which the electrons could travel.

Let us join the two poles with a piece of copper wire. We will use a coil which contains many feet of wire and which has considerable resistance. Resistance is to electricity much as friction is to a mechanical machine. It impedes the flow of the current, but does not stop it. Now, in the copper atom the electrons are somewhat loosely attached. It is not too difficult to add an electron or take one away.

At the negative pole of the cell, some of the pent-up electrons enter the atoms of copper that they first encounter and each electron that enters an atom forces out an electron from the other side of that atom. This electron in turn enters the next atom beyond it, and so on.

Meantime, at the positive pole the electron hungry atoms of carbon have begun to steal some electrons from the nearest copper atoms. These are replaced by the electrons coming from the negative end of the wire.

We now have a stream of electrons flowing through the copper wire from the negative end to the positive end. However, this does not mean that any one electron makes the entire trip. It is more like a relay race. One electron runs a short way, then rests as another electron continues the race.

We must remember that all of this happens at an enormous speed. Much faster than the speed of a bullet. Let us imagine a torrent of tiny invisible bullets streaming through the length of this wire. *This is an electric current.*

It would be very surprising if such a current did not have some effect on its surroundings. It does have several effects and at this time we will consider two of them.

The current sets up a vibration in the molecules of copper—the kind of vibration that we know as *heat*. This wire does not feel hot because only a small current is flowing and what little heat is developed is absorbed by the air as fast as it is formed. Let us replace the long wire with another piece which is only 3 inches long. Don't touch it! It is getting hot. See—the insulation is beginning to smoke. This effect of an electric current is used in the electric lamp, the electric range, and the electric space heater.

Now, let us replace the long wire and hold a compass near it. When we connect the wire to the battery the needle moves. When an electric current flows through a wire a magnetic field is formed around the wire. Now, this magnetic field is invisible. It is another thing that we have to imagine. It encircles the wire so that if it were visible it might look like a large number of small rubber hands strung on the wire. Although it is invisible, its presence may be easily demonstrated because it is a magnet just like this little steel magnet. It will attract iron and a few other substances. That means that it exerts mechanical power that can produce motion and perform work. All electric motors are based on this effect of an electric current.

We hope that the foregoing has made our method clear to the reader. We cannot know for certain just what kind of a mental image is created in the mind of the student, nor does it matter.

The point is that he should form such an image that the electric current seems just as real to him as if he could see it with his eyes. This enables him to learn about something that he cannot see.

How do we know that the learner has accomplished this? When he begins to learn circuit work rapidly. When he can figure out the operation of circuits that are new to him by looking at the circuit drawing and can clear trouble by a reasoning process, we may be sure that his imagination is working.

Other basic principles of learning and teaching will be discussed in a subsequent article.

today's

Highlights

of finance-taxes-business trends

by Willard F. Stanley

BOND YIELDS RISE AGAIN: Contrary to general expectations, bond yields on new offerings of utility funded debt rose during the past 30 days (ending in mid-May). Although offerings did not appear excessive in quantity, the shelves of the underwriters developed a considerable inventory of unsold securities with the result that shortly before May 15 several syndicates were dissolved with bonds unsold, and prices declined somewhat as a result. Whereas on Apr. 16, a triple "A" rated utility bond issue was offered successfully at a 3.7 per cent basis, a month later, following dissolution of the syndicate, a similarly rated issue was priced at a 3.8 per cent yield.

Also yields on new issues of double "A" rated utility funded debt had by that date climbed to slightly over 4 per cent. This compares with a peak yield on this type of security of 4.22 per cent at the end of the period of "over-crowding" of the offering schedules (experienced in late Feb. and early March) and with a 3.6 per cent yield on such an issue back around Jan. 21.

This upward trend in bond yields is all the more surprising since it follows several steps taken in April by the Federal Reserve authorities to ease credit both by reducing rediscount rates and liberalizing member bank reserve requirements. The last reduction in rediscount rates brought them down to about half the rate effective in late fall of last year, before the "right-about-face" in credit policy adopted by the board at that time.

Wall Street Journal tabulation shows that with respect to 13 recent bond issues of utilities, average yields based on bid prices at May 15 were three decimals (0.03 per cent per annum) lower than the average yield on the basis of the original offering prices. Seven of these issues were lower in the current price than the original offering while the price of six was higher currently.

This would indicate comparatively little overall change in yields and probably does not reflect the recent increase in yields because these newer issues were too recent to show a material change in price.

Many other factors seem to disparage the possibility that this evidence of tighter long-term money reflects the end, or rapidly expected termination, of the recession. It may be merely the end of a necessary correction of a too-rapid decline in bond yields on new securities which commenced early in December 1957 and which, in 60 days had reduced bond yields by an average of over 1 per cent per annum.

Mr. Stanley, formerly a utility financial executive, is now president of Corporate Services, Inc. of New York City and is well known as a financial writer. He is a member of the Controllers Institute of America and the New York Society of Security Analysts. He serves on the Finance Management Committee and the Tax Committee of the Controllers Institute (N. Y. Control). His articles are appearing once a month in TELEPHONY.

It still seems probable that the next few months will show somewhat lower money costs for long-term debt, but the fluctuations appear unlikely to be sufficiently drastic (either way) to indicate the advisability of prospective issuers of utility bonds either accelerating or deferring such offerings.

Along with the general improvement in the stock market, utility common stock equities continued to gain in market value during the month ended May 15, so the picture for issuers of this type of security still looks rosy and indicates the desirability of doing common stock financing expeditiously for equity needs within the next year, or even longer.

* * *

RECESSION RUN-AROUND: The recession is getting to somewhat resemble the weather, as Mark Twain defined it, i.e., everybody talks about it but nobody does anything about it. With all the talk in political channels, hardly a single step has yet been taken designed to improve the national economy. Increased public spending is still frowned on by the administration and tax cuts are heard of less frequently and seem to have lost some popularity.

It may be we can come out of the recession without massive governmental assistance. Reports recently seem on the spotty side. Some business leaders indicate pickup in orders, or decline in inventories. Some businesses have deferred planned layoffs of employes, etc. Because of the seasonal increase in April, employment showed an increase for that month for the first time in many. But First National City Bank's monthly letter points out the employment increase was only one-sixth of that normally to be expected, seasonally. First quarter reports from over 800 companies tabulated by that bank, indicate a 31 per cent drop in earnings as against the quarter ending Mar. 31, 1957.

Every type of industry separately tabulated showed a decline for the period, except tobacco, drugs, cosmetics, etc., retail and wholesale trade and utilities. Telephone and telegraph recorded a 1 per cent decline, but electric and gas companies included in the report showed an 8 per cent increase. This underscores the value of utilities generally, and electric utilities in particular, as desirable investments during the recession, plus holding out hope of appreciation in market values, dividends and earnings—which should continue into better times.

* * *

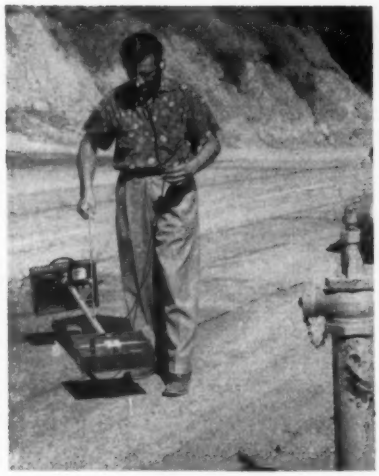
GOOD STOCK PRICES FROM BAD NEWS: With March quarter reports being released by most companies during the 30 days ended May 15, and most of these showing declines (some quite drastic), the stock market furnished something of a surprise by a faulty consistent upward trend until nearly the end of this period, when unsettled foreign conditions plus a to-be-expected technical correction, brought the averages down.

The New York Times 50 combined stock average, which, at Apr. 17, was a bit less than 2 per cent above its 1957 close, almost equalled the 7 per cent increase over the 1957 year-end, previously reflected, before dropping back to about 4.5 per cent above the Dec. 31 figure at May 20. This increase in stock prices was fairly general, but low-priced stocks got the lion's share.

During 1958, the percentage increase in this type of listed stock has far exceeded that experienced by the higher-priced "blue-chip" type of equities. This is usually considered to betoken "weak" (uninformed and largely speculative) buying.

Where do we go from here? A moderate movement in either direction wouldn't be surprising, but at mid-month levels most stock seem to have risen to prices (and dividend yields) which appear justified only if the recession is to shortly cease and better business and earnings prevail.

Until there is convincing evidence that this is likely to occur soon, it seems wise to limit new investments to utilities and highly selected industrial situations with reasonably good protection in case the recession should continue. Electric utility equities still remain a "standout" as dual-purpose investments, particularly attractive under today's unusually confused conditions.



Wilmer Burtness, engineering assistant, shown with pipe locator in search for suitable underground pipes for grounding purposes.

Engineering Assistant Harry Taylor, who completes the two-man grounding crew, determines depth of an underground pipe with special instrument.

The grounding crew, having arrived at their field rendezvous, prepares to go into action by donning their work clothes. Photos by John Busse.

The Earth Searchers

By HARRY WILSON*

FOR MANY months now, two men have alighted from a telephone truck, donned coveralls and walked about looking at the ground carrying an odd contraption resembling a Geiger counter.

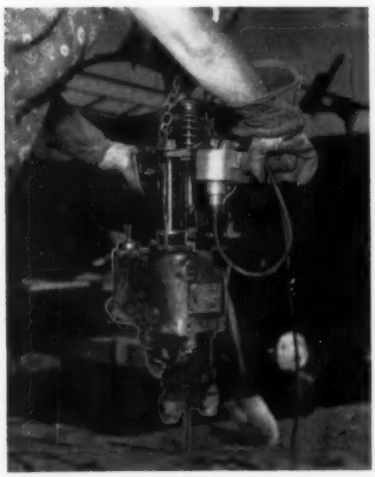
An observer might think that General Telephone Co. of California has gone into the uranium business, but actually these men are known as the "grounding crew," and are, in reality, searching for effective ground connections for our telephone wires.

*Mr. Wilson is Protection Engineer of General Telephone Co. of California of Santa Monica, Cal.

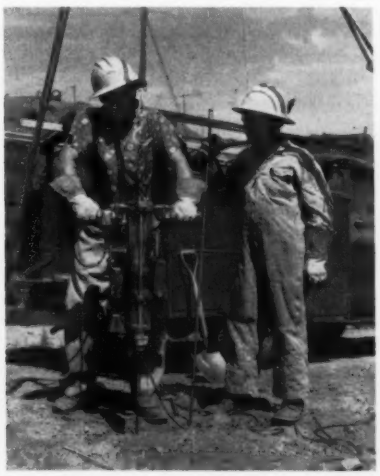
The grounding crew travels throughout all divisions assisting division forces who have difficulty in obtaining the specified ground resistances as outlined in our construction practices.

The grounding truck resembles that of the installation force in appearance, but special ground resistance testing equipment is quite different from what one would expect to find on a telephone truck. Among other things one will find: A pipe locator which is used to find underground pipes for possible ground connections, an adjustable metal tripod which supports a heavy gasoline hammer, and a number of 5-foot Copperweld sectional ground rods which are driven into the earth by the hammer.

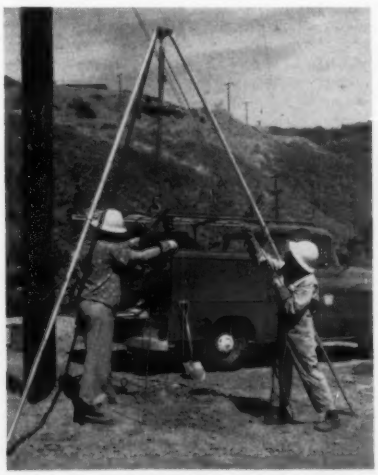
Harry Taylor and Wilmer Burtness,



Close-up of portable hammer to drive in the copperweld sectional ground rods.



Burtness operates gasoline hammer, supported by tripod, as Taylor holds rod to connect to others.



The grounding crew sets up tripod and hammer, ready to start on the next grounding point.

engineering assistants, make up the two-man grounding crew.

Adequate ground connections are of vital concern to General today. Since it is frequently necessary for our company to share joint use of poles with power companies, our wires are exposed to high voltages. To safeguard against such high voltages being transmitted into our lines, we have, through our engineering department, combated such dangers. Adequate ground connections become more demanding as power companies continue to raise their primary distribution voltages. For several years, where joint use of poles to support high voltage conductors was planned, the objective ground connections were specified by T. J. Fleming, transmission and protection engineer.

After various divisions reported difficulty in obtaining these ground connections, our engineering department decided to form a special crew to make field surveys, assist in the establishment of grounds and make recommendations for the relocation of ground connections, if necessary.

The grounding crew goes into action on a scheduled basis as soon as the transmission and protection engineer is informed of locations where ground resistance requirements cannot be fulfilled. The earth searchers are dispatched, and the hunt begins for acceptable ground connections. Municipal or privately-owned water pipes, other grounded metallic structures of a permanent nature, power company grounds and Copperweld sectional ground rods, driven deeply into the earth, generally offer our best source of low resistance connections.

After making a field survey it is often found necessary to relocate existing or specified ground connections. In this instance, on-the-spot computations are made, based on measurements taken in order to satisfy grounding requirements. The telephone plant involved is inspected so that connections to grounds will be placed in the most economical manner. Recommendations are then forwarded to the division as soon as possible in order to protect the lives and property of our subscribers and employes.

Another function of the grounding crew is to investigate telephone plant damage from high voltage power line contacts. Some of the causes of such damage are: Broken conductors, dirty insulators, automobile collisions with utility poles, lightning, careless tree trimming, wind, rain, kite strings and even birds. Being so susceptible to damage from such a diverse number of elements makes it extremely important that our ground connections are the best possible. Of course, cables with properly grounded sheaths and open wire and telephone instruments with well-grounded protectors prevent high voltage damage, or else reduce it to a minimum within safe limits.

We recently adopted a new method for obtaining central office ground connections. Instead of the spiral sheet copper and charcoal beds formerly used, we now place Copperweld rods deep in the ground for voltage protection. This method was adopted after extensive study of the locations involved.

The theory of driving a rod to great depths to reach a permanent moisture level, and thus obtain low resistance grounds, has proven to be far more effective than placing a larger, but more shallow ground bed. With the use of 5-foot Copperweld sectional ground rods and a power driven hammer, rods have been driven to a depth of 95 feet. Satisfactory grounds, however, are usually obtained at depths of 30 to 50 feet.

The grounding crew uses this same "deep rod" method in the field. For instance, let's assume our cable is carried on poles which also carry a voltage load of a certain degree, and that this load shows that safe ground connections are indicated at a point every quarter-mile. Our grounding crew would first use the pipe locator in searching for possible existing underground pipes to which our ground connections from the cable would be made.

If, however, they cannot find such connections, they would then make arrangements for deep grounding by using Copperweld sectional rods. A large tripod is set up which supports a portable gasoline hammer. While one man operates this hammer, the other places the connecting 5-foot rods.

The men of the grounding crew perform specialized work that is as interesting as it is necessary. They have the satisfaction of knowing that their job is an important link in our company's effort to protect life and property.

SAFETY THUMB TACKS

By John A. Bracken

Bits of safety reasoning, either pointed or flat, depending upon the way you look at them:

"Finding the *Safest* way of doing a job depends upon how *Safety*-minded you are."

•

"*Safety* is an important detail in job planning."

•

"If a workman isn't performing his job *Safely*, he needs more training in *Safe* practices."

•

"The worker on a job writes his own *Safety* insurance policy."

•

"At all times and under any circumstances—*Safety* should be the watchword."

Vail Award Given Illinois Bell Employe

The Theodore N. Vail award, given to telephone employes for heroic acts, was awarded on May 12 to Shelby S. Monaghan of Centralia, Ill., a communications serviceman of the Illinois Bell Telephone Co.

The award was given to Mr. Monaghan for his quick action in lending aid to victims of a two-car accident in Central City, Ill., in 1954.

Mr. Monaghan removed Robert Leber of Centralia from a ditch partly filled with water, directed a passer-by to call an ambulance and extricated Mrs. Catherine Gilmore of Odin, driver of the other car, from behind the wheel where she was pinned.

Mr. Leber remained in the hospital for several weeks with a broken shoulder and several fractured ribs. Mrs. Gilmore was not seriously hurt, and was released from the hospital shortly after her arrival. Mr. Leber, an employe of the Centralia Baking Co., credits Mr. Monaghan with saving his life.

PUSHBUTTON TELEPHONES

THE rapid advance of electronics in the telephone business has not been confined to repeaters, carriers and central office switching. The march of science has caught up with the ordinary telephone, and the subscriber's set in the future will bear little resemblance to present-day instruments.

The *Bell System Technical Journal* describes some exploratory developments in station apparatus. These are tone-ringing and push-button calling. While it is expected that instruments embodying these features will be present in electronic exchanges, Bell Telephone Laboratories have developed experimental telephones which can use these electronic principles in present-day exchanges.

One advantage of electronics in the subscriber's telephone is the great reduction in power required. For example, the ordinary 20-cycle ringer at present requires about 1 watt of power to operate. An electronic ringer (a small loudspeaker mounted inside the telephone) would require only about 1 milliwatt of power to cover the same area with sound. Further, the electronic device would operate in the voice frequency range, which means that special relays, coils, bypasses, or long line equipment would not be required to handle the signaling.

A circuit for an electronic ringer which would operate from the 20-cycle ringing power was shown in the Nov. 24, 1956 issue of TELEPHONY'S ELECTRONIC SECTION. However, the present development of the laboratories contemplates the use of eight different frequencies between 478 and 1,000 cycles, for

This experimental push-button telephone generates its own calling and party identification frequencies. It can be adapted for use with present-day automatic switching offices.

"ringing" or sounding the small speaker in the base of the telephone.

This would enable an eight-party line to have full selective ringing by using a different frequency for each of the parties. In order for each telephone to respond to the correct frequency, a frequency selective network would be required in the instrument. This network can be made to serve another purpose, that of party identification. That is, it would be hooked to the sound radiator when receiving an incoming call, but on an out-going call the switch hook contacts would transfer the network to a position in the circuit where it would send out a short burst of tone when a number was called in order to tell which of the parties was making the call.

The electrical circuit used includes a transistor which serves as an input limiter, which supplies a constant current to the frequency selective network and to a second transistor which serves as an amplifier. Power for operation of the transistors is drawn from the direct current normally present on the line.

A device of this sort would normally be subject to a trouble known as "talk-off." This means that when the line was being used for speech, some of the voice would come out of the sound radiator which is supposed to be used only for signaling. This would happen not only at the

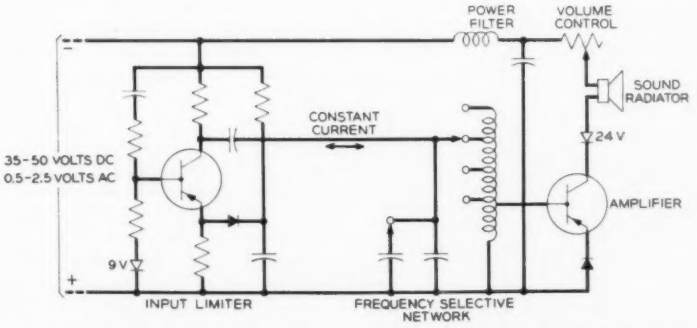


***Fig. 1. This is the tone "ringing" circuit for the push button telephone. The four taps on the coil and the two capacitor options enable the instrument to be connected for any one of eight party frequencies. The 24V diode in series with the amplifier and the sound radiator will not conduct when a receiver is off the hook, thus preventing the voice from coming out of the speaker. (Drawings from the* Bell System Technical Journal)**

station in use, but also on the party stations and extensions.

This is prevented by means of a silicon diode connected to the amplifier transistor. This diode has an "avalanche" breakdown voltage of 24 volts. This means it will hold the collector voltage of this transistor to a value 24 volts less than the line voltage; that is, not more than about 26 volts.

When a customer has a receiver off the hook on a line, the normal voltage of about 50 drops to less than 24. This is not enough to cause the silicon diode to conduct, hence it remains in an open circuit condition. This, of course, opens the circuit to the sound radiator and prevents it from responding to the speech signals.

A companion to the tone ringing principle is the pushbutton calling system. This consists of replacing the dial on the telephone with a set of pushbuttons, which will result in different frequencies being sent on the line as they are depressed. These frequencies would trigger corresponding circuits in the central office and thus establish a connection to the number called.

In the experimental set, as presently developed, no oscillators are provided in the sub-set. Instead a parallel resonant circuit is provided which can be shock excited into sending out a few cycles of the desired frequency whenever a button is depressed. The frequencies presently used are 1111 to 2868, which it will be noted do not conflict with the frequencies used for ringing as mentioned above.

The subscriber's set would have a set of pushbuttons in place of a dial. The underside of the buttons would be wired like a manually operated crossbar switch. The horizontal wiring would be connected to one of three condensers. The vertical wiring would go to taps on a coil.

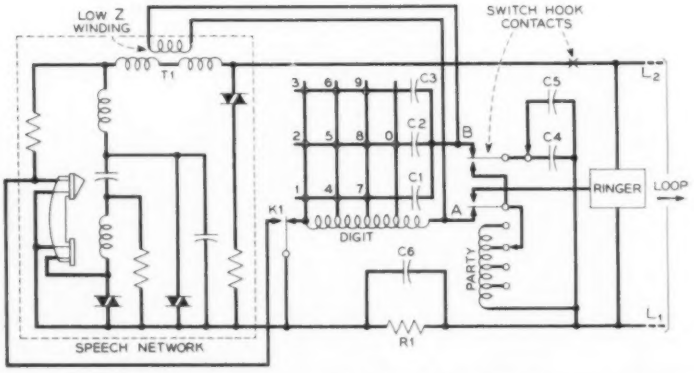


Fig. 2. The cross wire network in this drawing is switching arrangement for the push buttons on the telephone instrument. Each cross point connects together a different combination of coil turns and capacitor. Switch K1 operates from all buttons and cuts in R1 which sets central office apparatus to receiver spurt of tone. Both digit and party coils send tone into T1 through the Low Z winding.

Thus, when any button was pushed, a condenser would be connected to a certain number of turns of wire in the coil.

When a customer removed the receiver from the hook to make a call, current would surge through the coil charging it magnetically. When a button was pushed, a tap on the coil would be connected to a particular condenser, the energy in the coil would discharge through the condenser, causing a spurt of tone to be sent into a winding of the induction coil; from here it would be sent on the line to the central office. At the same time, the frequency selective circuit used in the ringer would also discharge a spurt of tone, but of a different frequency, into the line. This would tell the equipment in the central office what digit button was pushed and which party was using the telephone. As in the case of the tone-ringer, talk-off could also be a problem here. That is, sounds going into the transmitter might contain frequency components that, as in the pushbutton range, could trigger off circuits in the central office and result in a connection to a wrong number.

This is prevented by a unique arrangement built into the pushbutton switch. When any pushbutton is depressed, the cross-points are made first, which connect a tap on the coil to one of the condensers; then a snap-action switch breaks the circuit to the coil, cuts a resistance into the line and shorts out the transmitter.

Normally, the register circuit in the office which will receive the tone pulses is in a non-operative condition. When the line current suddenly drops as the button is depressed, this operates an enabling circuit, which permits the register to receive the tone pulse. During this instant the transmitter is shorted.

When the button is released and the short is removed from the transmitter, the line current again rises and the register becomes insensitive to inputs from the line. The change in line current, resulting from pushbutton calling, is not sufficient to disturb the supervisory relay and to lose the call.

Under full electronic switching conditions, the tones as received from a subscriber's telephone might be used to trigger circuits which are as yet uninvented or undisclosed. However, a translater can be used, which will convert the received tones into direct current signals which can be used in present-day dial switching offices.

The signal from a subscriber's line would be received by a cutapart filter, which would separate the frequencies used for the digits called from those used for party line identification. Each group of frequencies would be sent to an amplifier-limiter, then to appropriate selective circuits, which would identify the frequencies being sent. Each frequency received would be sent into a translator, which would trigger thyratron tubes. The plate circuit of the thyratron would operate a relay, which in turn, could operate the appropriate register relays in a panel or crossbar sender or similar unit.

Most common-control dial switching mechanisms use a register code which involves the operation of two out of five relays in order to record 10 digits. This principle could be adapted to the station set in pushbutton dialing; however, this would require that each button pushed send out a combination of two different frequencies.

This could result in more complicated circuitry in the customer's set. This would be particularly true in view of the fact that party identification with a separate frequency is also desired. Largely for this reason, the experimental set uses a separate frequency for each of the 10 digits to be pulsed.

The conversion to a two out of five code in order to integrate with present-day apparatus is accomplished by the translator. This is done by taking any single frequency lead and connecting it to two different thyratron tubes, thus any one frequency will result in two register relays being operated.

The new pushbutton instrument is only one of several different devices being tried in connection with electronic techniques in the telephone business. Other techniques will probably be developed before a final design is decided upon. The pushbutton and tone system described here has

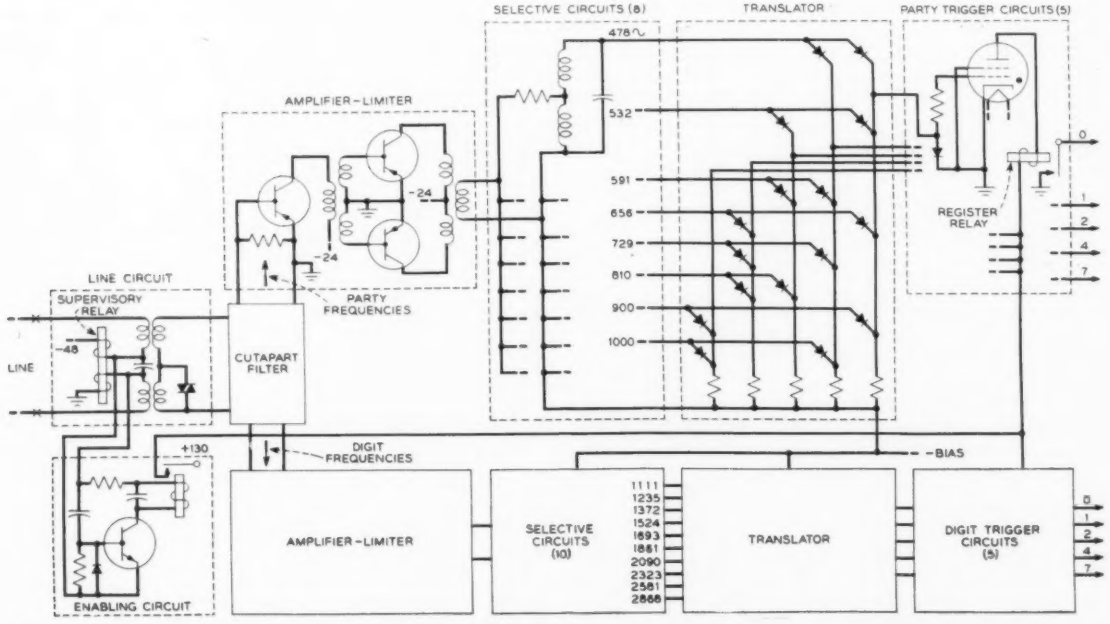


Fig. 3. The central office equipment consists of an adapter to change digital push-button numbers into two out of five for sender register. Cut apart filter routes party signal to one amplifier, called number signals to another. Each tone filter in the translator connects through crystal diodes to two thyratron tubes and two register relays, thus registering ten digits on five relays. Enabling circuit activates relays when switch K1 in telephone adds resistance.

been in use experimentally by the Bell laboratories for some time. The tone signaling apparatus was given a field trial on rural lines at Americus, Ga., and by a more extensive trial at Crystal Lake, Ill.

COMMUNICATION SCIENCES

IN THIS rapidly advancing electronic era, scientists are becoming aware of a need to match man and his machines together. In many cases, man's machines can act faster than his ability to keep up with them. Planes that travel faster than a bullet leave no time to think what to do next. Because of this, the SAGE system was developed which by means of radar, computers and new communications methods, can analyze a battle situation and direct an instant weapon response.

Now the Massachusetts Institute of Technology, whose Lincoln Laboratory developed the SAGE system has established a Center for Communication Sciences. The new center will study the functions of the nervous system of man and the workings of computers, and plan better means of communications between the two.

Today's problem was summarized by Dr. Jerome Wiesner of MIT's Research Laboratory of Electronics. "We build computers which analyze data faster than we can use the answers. On the other, hand computers . . . have to be told how to solve problems and this takes a great deal of man's time," he said.

"We believe that collaborative work between mathematicians, electrical engineers, linguists, psychologists, physiologists and others should lead to a new understanding of communications and a more effective use of machines."

Man's current difficulties can be summed up in the plight of the airline communication engineer who has a nation-wide network which will transmit a seat reservation to a center in two minutes, only to have it lay in a basket for three hours waiting for somebody to read it.

INTER-COM

TELEPHONE men who must work in pairs at opposite ends of circuits might be interested in a new talk-back unit developed by Stewart Brothers. This is a transistor communication unit equipped with a talk and listen switch. It can be connected to any line and has a loudspeaker which can be heard at a distance of 20 to 30 feet; but a volume control provides a sound level as required. Four self-contained penlight batteries power the unit, but operation does not put any direct current on the line.

A special test cord is available which will couple the unit to a carrier system if required. You can get a circular describing this unit from the Stewart Brothers, 315 W. Walton Place, Chicago 10, Ill.

MOBILE RADIO

THIRTY-NINE new authorizations were made to telephone companies for two-way mobile radio systems according to the FCC annual report. As of June 30, 1957, there were 317 licensed systems and 25 new systems held construction permits. In addition, the commission reports the present telephone company trend is toward greater radio usage for inter-city facilities with wire lines being used for local distributions. The impact of microwave on the telephone business is such that more than half of the Bell System's inter-city facilities are now on radio circuits.

The 4,000-megacycle range is presently widely used by the Bell System and Western Union and there is an increased usage of the 6,000 megacycle frequencies primarily by independent common carriers. The new TH system for use in this region is expected to result in the lowest cost per telephone circuit mile yet achieved.

The FCC report also states that eight new radio systems for one-way signaling radio paging service were authorized. Rural radio services are also on the increase. Last year the total of these authorizations rose to 222. Of these 23 are central office; 63 are inter-office; and 136 are subscriber stations.

NEW UHF RADIO

A NEW 900-mc radio system for telephone companies has been developed by the Federal Telecommunication Laboratories. The system will accommodate 120 telephone channels in a 500-kilocycle bandwidth using single sideband transmission. Present systems which use other types of modulation, such as frequency or pulse modulation, use large bandwidths, usually 30 to 40 kilocycles per channel. The new system uses just a little over 4 kilocycles for each channel.

Although designed primarily for line-of-sight transmission, the single-sideband equipment is adaptable to over-the-horizon microwave through the use of bigger antennas and larger amplifiers. Total power required to operate the transmitter and receiver of the new system is only 65 watts.

THERMAL BONDING

ONE of the problems involved in soldering leads to a semi-conductor arises from the fact that they are so very small to work with. In addition, soldering, because it involves a liquid phase, gives rise to problems of alloy depth control, wetting, and chemical contamination. As a result Bell laboratories have been

doing considerable research on the adhesion of solids.

Out of this has come a technique known as thermo-compression bonds. This means causing materials to adhere by means of heat and pressure. A typical method for doing this involves placing a gold wire on a block of germanium. The wire is crushed down on the crystal by means of a heated wedge. A pressure of from 5,000 to 10,000 psi and a temperature of from 200 to 300° C. for five seconds will cause the two materials to adhere.

GOVERNMENT PUBLICATIONS

A NEW price list of government publications about electricity, electronics, radar, and radio is available free of charge from the Superintendent of Documents, Washington 25, D. C. It lists 31 books on a wide range of electrical circuits, covering everything from learning the Morse Code to the employment opportunities in the industry.

DATA TRANSMISSION

A NEW distortion test set for measuring data transmission circuits has been developed by the Western Union Telegraph Co. A description of this test set which is transistorized, is presented in an article in the April 1958 issue of the *Western Union Technical Review*. It was written by J. Edwin Boughtwood, a telegraph company transmission engineer and Thomas A. Christie Jr. of Lenkurt Electric Co.

NEW TRANSISTOR

THE typical transistor has consisted of a sandwich of semi-conductor materials of the positive and negative types. The top frequency at which a given transistor could be used depended largely upon the area and thickness of the semiconductor layers. There have been practical limits to the extent to which thickness and resistivity of the central or base layer could be reduced.

Now, a new design has been developed which uses an intrinsic or neutral layer to provide increased spacing between the base and collector layers. This has permitted transistor operation at higher voltages and higher frequencies. The new device is called "The Intrinsic-Barrier Transistor" and is abbreviated p-n-i-p. Frequencies up to 460 megacycles have been realized with this construction according to the *Bell Laboratories Record*.

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Nebraskans Take A Look Ahead

At 58th Annual Convention

By Dan S. Fargo

THE Nebraska Telephone Association's 58th annual convention, held in Omaha on Apr. 21-23, had as its theme "A Look Ahead." Figuring in the look ahead were not only talks in this vein but plans for 43 conversions to dial service in 1958.

And, figuring heavily in the friendly atmosphere of the meetings, was a first-night buffet meal sponsored by the association for manufacturers and suppliers as well as operating people.

James B. Moore, vice president, Nebraska area, Northwestern Bell Telephone Co., in welcoming conventioneers, quoted three University of Nebraska economists as saying the state's economy has remained stable in recent months in contrast to the recession in the nation-at-large. Brief analysis brought out: (1) Nebraska's economy is chiefly agricultural; (2) a severe drought in 1956 helped level off the postwar boom, and (3) the dry year was then followed by two good years for crops.

In his report to the association, Vernon A. Allan of Scottsbluff, president, asked that all members keep the association informed of items worth covering at a convention or district meeting. He also said, "For each of us the future is challenging in this telephone business. To prepare for it may each strive to meet the challenges in our service areas; may we maintain a strong association to confront the problems faced by all, and may we be able to report continued progress at the 1959 convention."

Laying out his "Blueprints for Tomorrow," J. T. Naylor, vice president of United Utilities, Inc., and president of United's subsidiaries in Arkansas, Kansas and Missouri, analyzed Nebraska's growth from several standpoints, then presented this challenge to the state's Independents:

"According to my sources, there are roughly one-half million telephones in Nebraska with approximately 47 per cent being served by 170 Independent telephone companies and the balance of 53 per cent served by Northwestern Bell. At the beginning of last year it appeared that 58 per cent of the total telephones were operating on a dial basis and the remaining 42 per cent, or well over 200,000 telephones, were served through manual switchboards. Two conclusions fall out of these statistics.

"First, the Independent challenge in this state is major, both on an absolute basis and on a proportional basis as compared with the total telephone development.

"Second, the Independent dial conversion and technical challenge is probably as great, if not greater, than the Bell System's because of the scattered nature of the telephone development served by the Independents."

Another aspect of Mr. Naylor's blueprint involved the technical objectives in designing telephone properties. He said the first and predominant consideration in designing physical plant is integration and coordination, or the "packaging," of efficient service units. He continued:

"A single exchange operation may appear to have a relatively simple problem achieving these purposes, but even for this type of operation, it is necessary to explore and include answers to the following questions before purchasing and installing new plant.

"Does the toll and network program call for provision *now* of floor space and possibly certain switching equipment to achieve the ultimate mechanization of toll timing and ticketing?

"Is the toll traffic volume to nearby tributary communities and out on the nationwide network such as to justify investment in toll recording apparatus now or in the foreseeable future?

"Do existent toll routings provide the best medium for service and economy?

"Do adjacent Bell or Independent exchanges have new plans for toll handling which will influence a coordination program?

"Are such adjacent exchanges able and willing to time and ticket traffic for

View of the directors meeting. Left to right: G. L. Jorgenson of Indianola; Clell D. Elwood of Hay Springs, newly elected president, and Robert C. Hunt of Blair. (Back to camera is J. Earl Nelson, association secretary-treasurer.)

you either manually or automatically or both, or should this be an integral part of the local exchange design?

"If the handling of dialable traffic can be mechanized, how and where can person, collect, coin box and DSA operations best be handled over the long pull?

"Until all of these questions have been thoroughly answered on a sound engineering basis, no exchange is ready to place orders for equipment, or to finalize new and additional investments. Events which may transpire among neighboring exchanges during the next five years may be as important to us as those within the confines of our own exchange."

Mr. Naylor went on to discuss the more complex problem of integration and coordination which exists when a company operates clusters of exchanges.

He also stated that the area coverage ideal introduces many serious problems for companies serving vast areas such as exist in Nebraska. However, there are technical resources which shouldn't be overlooked in the planning of universal exchange service coverage. These resources he listed as follows:

Subscriber line carrier equipment is approaching practical perfection, materially reducing the costs and problems of extending service throughout the countryside.

Similarly, satellite pole-mounted dial units and small community dial installations may be recommended where clustered rural demand is found.

The economies of reduced trunking facilities to a principal exchange should be examined in these situations.

Buried cable plant may be practical, minimizing weather exposure of aerial plant and in some cases reducing initial access investment.

Mr. Naylor added: "In this technical sphere of our planning, I feel that our biggest hazard is a closed or lazy mind. . . . It has been my impression that such conventions as these and the trade press perhaps serve their most constructive role through enlarging our perspective and understanding of new techniques."

"The Importance of Regulation, Service and Public Relations in Telephony" was the subject of a talk by Joseph J. Brown, chairman of the Nebraska Railway Commission. Among his views on regulation were the following:

"I am here representing another very important part of your industry; namely, the regulator. Some might say that a regulator should not call himself a part of your business. I do not hesitate to do so, for while we serve as the guardian of people's rights and welfare, we also have a statutory and quasi-judicial duty of safeguarding your industry so that it can continue in existence for the purpose of serving these very same people.

Max C. Walker of Lincoln, makes his presentation as part of a panel on "Maintenance of Earnings in the Small Exchange." Another panel member is Al Andrews (left) of Omaha. At right is J. Earl Nelson, secretary-treasurer of the association.

"Regulatory bodies must have a balanced view looking toward stimulation of expansion rather than only the cost of service to the public.

"We must not lose sight of the fact that the fulfillment of a commission's obligation to the public can be achieved only when the utility is in a consistently sound financial condition. The interest of the consumer is inescapably linked to the condition of the utility.

"Only the financially strong company can obtain the money needed to meet public demand for service. Commissions as well as utilities must have a long-range plan.

"One illustration of why a telephone company must be in a healthy financial position concerns planning for the future. If the company is not in a sufficiently financially healthy condition to take advantage of long-range planning; if it is forced into taking the short-range plan, in the long run it is the customer who suffers.

"The commission that fails to permit a company to continuously earn a reasonable and fair return is not, in my opinion, properly protecting those who depend on regulation to see that they receive efficient and dependable service."

Vernon A. Allan of Scottsbluff, reports on his year as president of the Nebraska association.

In the area of public relations, Mr. Brown suggested that a company's objective should be to earn a reputation that it furnishes good service, fairly priced; that it is a good company to deal with and to work for, and that it and its employes are good citizens in the community.

"As I see it," he continued, "public relations is a way of life of a business and not a job for a single person. It is a job for every individual connected with the telephone business whether it be the owner, the president, the manager, the operator, the installer, or the janitor.

H. A. "Jack" White of Lincoln, was guest at a luncheon honoring him for his 60-year career in the telephone industry.

A talk on "The Forward Look in USITA" was presented by Clive W. Haas of Big Timber, Mont., president of the United States Independent Telephone Association.

Mr. Haas observed that the forward-looking recommendations of the new USITA Merchandising Committee can mean considerable additional revenue for the company which puts them into practice. "You're not doing a complete job unless you merchandise," he said.

In the field of legislation, Mr. Haas said the USITA is watching the following closely to protect the industry's interests:

Highway relocation compensation. (He suggested that since the law could be repealed, companies should build lines off the highway where possible.)

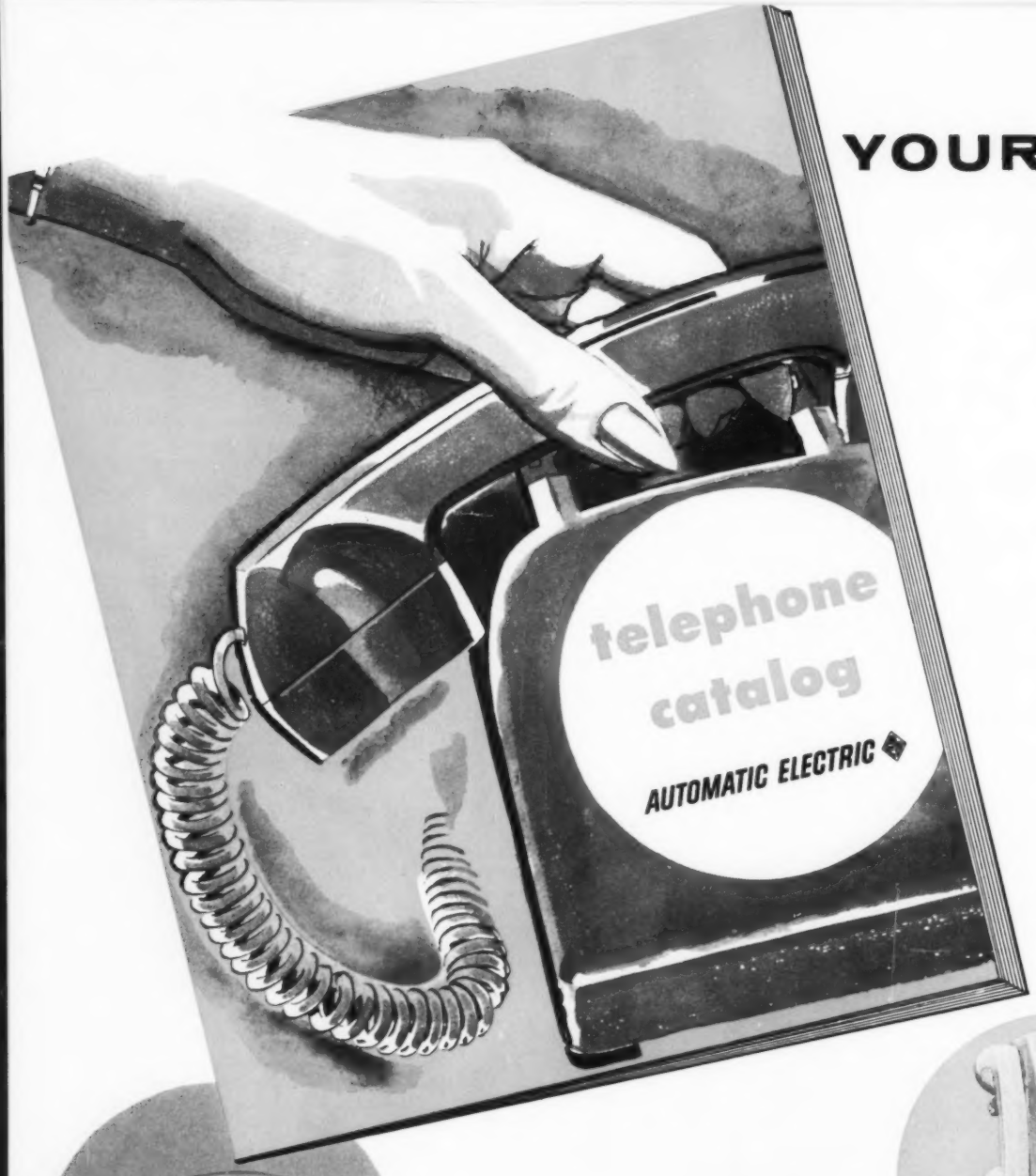
The 750-station operator exemption. (This is becoming untenable, he said.)

Increase in the minimum wage under the Wage and Hour Law.

Securities & Exchange Commission exemption.

(Please turn to page 30)

YOUR NEW



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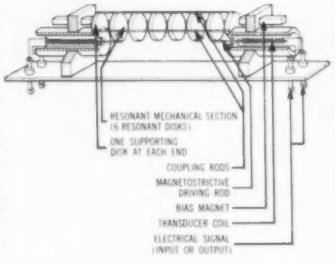

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COLLINS

CREATIVE LEADER IN COMMUNICATION

The campaign to repeal the discriminatory federal excise tax.

Mr. Haas issued an appeal for those Independents who are not members of USITA to join so that the national association might capitalize on the added influence new members would afford as well as the financial undergirding.

"The Telephone Role in SAC Communication" was described by P. C. Fenlon, chief of the telephone communication branch at Offutt Air Force Base near Omaha. To maintain a combat-ready global striking force, he said, the following defensive measures are necessary:

(1) Detect and prevent concerted acts of espionage.

(2) Strengthen bases to resist attack.

(3) Disperse aircraft over a large number of bases.

(4) Be able to get a sufficient number of aircraft into the air regardless of the severity of an enemy onslaught. This means maintaining a continuous alert and forms the backbone of the present defense.

He continued: "Every effort is being made to design improvements which will increase the amount of time available for warning. . . . Reliability and speed of getting the message through are highly important. One hundred per cent effectiveness is essential, and this is dependent on a multiplicity of circuits and channels of communication.

"There are presently five teletype and three telephone networks which tie Nebraska to the newest Air Force base in Madrid."

Reporting to the association, Secretary-Treasurer J. Earl Nelson urged members to avail themselves of the help of the association whenever they have rate cases to prepare. He stated that any company needing additional revenue would be doing a disservice to its subscribers to go along with insufficient revenues.

Mr. Nelson said if the following three questions can be answered in the affirmative, then management needn't expect any difficulty in seeking rate relief:

(1) Are company records adequate and accurate?

(2) Have opportunities to sell additional service been fully realized?

(3) Is the business being operated as economically as possible?

On the subject of the federal excise tax, Mr. Nelson said he thinks this added amount of money in the cost of telephone service makes it that much more difficult to sell additional service. Furthermore, he said, the public is largely unaware of its presence, and telephone companies have been missing a prime opportunity if they haven't drawn the subscribers attention to it in the monthly bills.

Max Walker, general plant superintendent of Lincoln Telephone & Telegraph Co.; Al Andrews, Nebraska area sales manager, Northwestern Bell Telephone Co.; and Keith Vogt, secretary of the Minnesota Telephone Association, were panelists in a discussion of "Maintenance of Earnings in the Small Exchange."

Mr. Walker's topic was "Expense Control and Earnings." He said that economies through good preventive maintenance practices depend not only on good supervision, but also on:

Mr. and Mrs. Clifford E. Thompson, of Dunning, relaxing between convention sessions.

Standardization on items used in outside plant; for example, standard telephones, hardware and tools.

Standardizations on work methods and practices. This may be difficult for small Independents, but the larger companies, as well as manufacturers and suppliers, stand ready to help.

Mr. Walker also observed that reading the industry trade journals helps, too.

Mr. Andrews, in outlining a sales plan for telephone companies, said it is essential to get the prospect to fully understand what the service will do for him—save steps for the housewife or employe time for the businessman for example. He asked: "What businessman can afford to have employes walking around the office to make calls on somebody else's telephone, when an extension would cost five cents a day or less?"

Rural areas offer great sales opportunities, too, Mr. Andrews stated. Extensions in the machine shed or milk barn; loud-ringing bells; intercommunication between house and other farm buildings, are some of these sales possibilities. He said, "Sometimes underselling a farmer can lead to his dissatisfaction." He advised using demonstration equipment, asking questions of all members of the farmer's family, and then quoting the price on a package basis.

Mr. Vogt urged that all REA cooperative and commercial borrowers become members of one state association with other Independents, and thus capitalize on their greater numbers and unity when proposing action before state legislatures or commissions.

The day is not far off, Mr. Vogt said, when at least 1,500 stations will be needed to operate efficiently, take advantage of modern improvements, and offer such services, as data circuits, telemetering circuits, radio-telephone and others.

The newly elected directors are: Neil Young of Cozad; Joseph L. Van Horn of Grinnell, Iowa, and Kenneth L. Lawson of Lincoln.

Directors retiring are: William T. Autry of Grinnell, Iowa; W. K. Flaming of Elsie, and C. E. Thompson of Dunning.

Other directors are: Vernon A. Allan of Scottsbluff; Robert C. Hunt of Blair; G. L. Jorgenson of Indianola; Clell D. Elwood of Hay Springs; John E. Kaldenburg of Burwell, and E. J. Lake of Omaha.

The directors elected the following officers: President, Mr. Elwood; vice president, Mr. Van Horn, and secretary-treasurer, J. Earl Nelson of Lincoln.

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THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

YOUR WRITER has just returned from a most interesting trip by air to Fort Riley and Junction City, Kan. We flew from Washington, D. C., to Kansas City, non-stop on a United Airlines DC-7 and then to Manhattan, Kan. on a Continental DC-3; that old workhorse of the air. Four days later, we returned by the same route. On the trip out, we again witnessed the marvels of airborne storm warning radar as the United's pilot was able to dodge heavy clouds at 20,000 feet with no apparent discomfort to the passengers.

We first spent some time with the communicators of the Signal Corps at Fort Riley. The communication facilities required at a large, modern army post are extremely interesting as well as complex. The telephone plays a most important part in the post's administration and its fire protection. Mobile radio is also extensively used to advantage.

Fort Riley, Kan. is one of the old Indian fighting posts and has a long and interesting history. One of the old standing orders prohibited shooting buffalo on the parade grounds. There are only four buffalo at the fort today and these earn their keep by reducing the length of the grass on the ammunition storage bunkers. Four antelope and one deer also assist in this operation. The Ogden Monument on the Fort Riley reservation marks the geographic center of the United States.

Fort Riley, in the old days, was a cavalry post and the home of the cavalry school. During both world wars, Camp Funston, on the Riley reservation, was an active training center. Fort Riley is now the home of a modern Infantry Division as well as numerous other special air and ground activities. This old post has a special interest to the writer for it was here that he first saw troops at drill. This happened back before the turn of the century when the Blain family passed Fort Riley in a prairie schooner as we migrated from the tall corn fields of Iowa to our bunch grass homestead in Oklahoma.

On our 1958 trip, we had several interesting communications discussions with R. J. Fegan, manager, and T. B. Fegan, plant superintendent of the Junction City Telephone Co. We have known these brothers for a long time as well as their father before them, Ben Fegan, who was well known in the Independent Telephone Industry.

The Junction City exchange was converted from manual to dial several years ago and expanded to meet the ever increasing communication demands of the community. The dial exchange is housed in a new and modern air-conditioned building, carefully designed to meet every need. The far sighted Fegan brothers have played it safe and provided space in the equipment room to practically double the exchange capacity. Then, as an additional safeguard, if this capacity should be exceeded, the manual toll and dial assistance switchboard can be moved into the old exchange building next door, and the space vacated utilized for a further expansion of the dial switching equipment.

The Fegans also have recently converted their Milford, Kan. exchange from manual to dial operation. This exchange is an unattended satellite and has dial service to Junction City. The Riley, Kan. exchange, recently acquired by the Fegans, will also be converted to dial operation in the near future. Moreover, it is expected that Direct Distance Dialing (DDD), in and out of Junction City, will be made available in the not too distant future.

It is always a pleasure for this chair-bound individual to visit any operating telephone company. And it is indeed a special pleasure to visit a modern, progressive company such as that operated by the Fegan brothers in Junction City. It is here that we obtain new ideas that materially help us keep up with the progress of our rapidly expanding industry. Yes, our visit to the Sunflower State proved pleasant as well as profitable.

•

Unhappiness has been defined as not knowing what we want and killing ourselves to get it.

•

Each trip we make to New York City, we invariably see something new. On a recent trip, we noted a truck lettered on each side: "Visual Public Relations." We were unable to learn the nature of this business.

Then, in the men's room in the Downtown Air Terminal, we noted an electric shaver that would operate 10 minutes after you had deposited a quarter in the slot. The razor itself rested on a rack in a small compartment flooded with a sterilizing light. A nearby sign warned that if the razor was cut or broken, an alarm would sound in a nearby police station. We took their word for this statement.

•

A number of the Bell companies have been using prefabricated concrete manholes for some time now with complete success. These manholes are cast and cured in the supplier's yards with reusable steel forms. They are then hauled to the proper location and lowered in place in the conduit run by the use of special equipment.

Not only does this arrangement reduce labor and other costs, but it also reduces the time of street openings which is most important in this age of heavy traffic.

•

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TELEPHONY'S Traffic Engineering Handbook

By Gilbert R. Brackett **May 31, 1958**

Section 15 (Continued)

Force Adjustment

Records of traffic must be kept and summarized frequently enough to show any trend toward changes in the level of distribution of the volume of traffic or the unit value of the calls. If a good job of estimating future force requirements is to be accomplished, there can be no substitute for accurate and competent data.

Peg counts, and other records on which such data are based, need close supervision if a precise job of compilation is to result. When a particular office is under survey, the use of sound judgment, based on an intimate knowledge of working conditions, employe's preference of hours, service requirements, and local conditions will be necessary if the projection of force needs is to be done accurately and completely.

Generally, only switchboards of four or more positions require force adjustment studies based on peg counts. Forces for smaller offices can ordinarily be administered to, and their force needs determined, by observation made by the chief operator.

Chief operators can be, and should be, trained to apply themselves to the art of force provision, thus securing the many advantages gained through the following of regular schedules which provide systematic lunch and incidental reliefs.

The frequency with which force adjustment studies are conducted should be based on the chief operator's knowledge of the requirements at her board. Best results come when force adjustment studies are conducted by people who have been trained in the procedures of force provision work.

In the larger offices, due to the detailed know how required, it is generally best to relieve the chief operator of the routine processes which can better be taken care of by people especially trained for such work.

Variations in traffic volume during different periods of the year at switchboards of 10 or more positions are often great enough to affect the number of operators needed by one or more. For this reason, records are needed two or more times a year.

During the process of a force needs investigation, it may be found that a certain local operating practice has

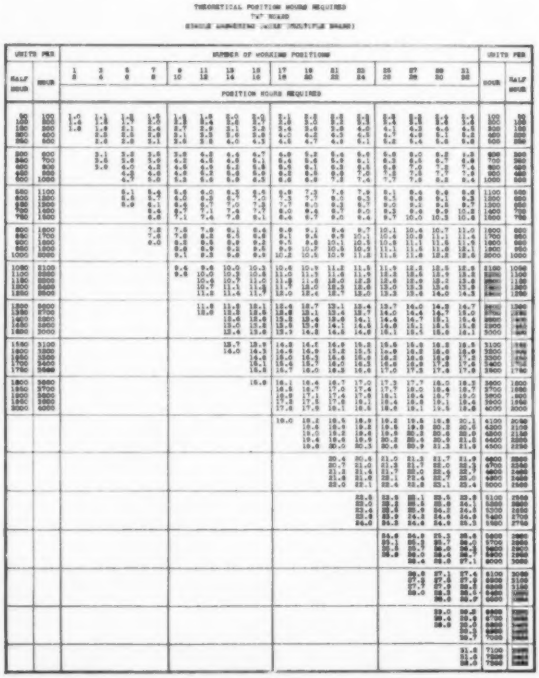


Table 1

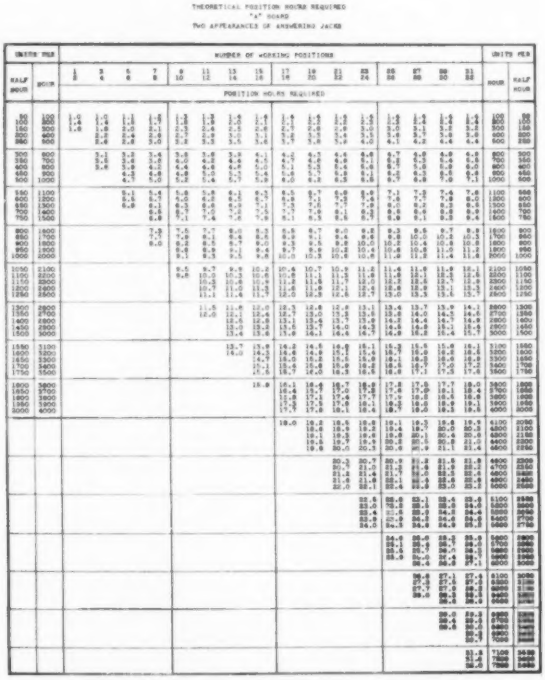


Table 2

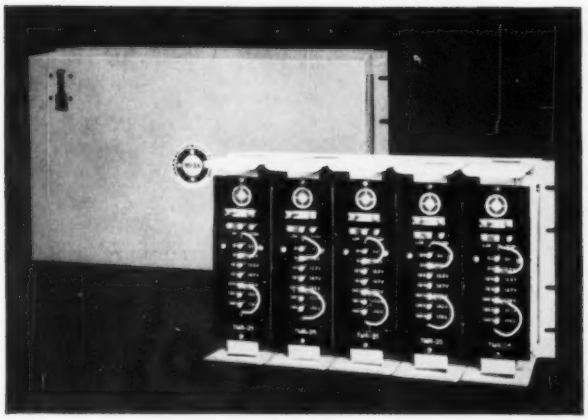
WARREN

first in

TRANSISTOR

products for the telephone industry

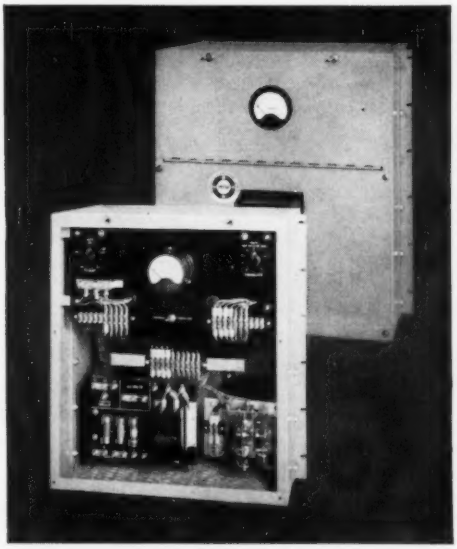
Now, the benefits of transistor circuitry are used by Warren to bring a new concept in power equipment dependability to the Independent Telephone Industry. Warren's new all-transistor ringing generators and new transistor battery chargers provide a degree of operating efficiency heretofore unknown...efficiency that will mean significant power savings in every exchange operation. Whether your plans call for expansion or needed replacements, investigate the many benefits of the new Warren transistor multi-ringer and transistor battery charger.



TRANSISTOR MULTI-RINGER...

for warranted dependability

Powered direct from 48 volt office battery, the Warren all-transistor type TMR ringing generator is designed to give you years of maintenance-free, adjustment-free, uninterrupted operation. Long-life transistors give extremely high 75% full-load generator efficiency... permit the TMR to quickly pay for itself in power savings alone! Voltage regulation is improved to insure customer satisfaction with constant ringing intensity. Synchromonic, Harmonic and Decimonic ringing frequencies are accurate to within 1/6 of a cycle and never require field adjustment. 100% transistor circuitry permits absolutely cool and quiet operation in a neat-appearing, self-contained package only 10½ inches high by 19 inches wide. This new 4000 line capacity Warren transistor multi-ringer... with dependability warranted...is available from stock.



TRANSISTOR FLOAT RECTIFIER...

for better battery management

Operating efficiently from utility power, the Warren type TFR transistor battery charger is designed to add years to battery life. A complete line of TFR's are now available in standard sizes from 3 to 400 amperes. Tubeless, completely static, they provide steady, humless direct current for float-charging of every type of 48 volt office battery. Floating or equalizing voltages are precisely regulated within ½ of one percent for changes in supply voltage and load. Germanium transistors, improved magnetic amplifiers, and silicon rectifiers assure dependability by eliminating troublesome vacuum tubes and selenium rectifiers. Efficiency is increased, regulation improved, while the size and weight are reduced. This gives you a reliable program of better battery management.

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LITTLETON, MASSACHUSETTS

FIRST IN TRANSISTOR PRODUCTS FOR THE TELEPHONE INDUSTRY

TELEPHONY'S Traffic Engineering Handbook

By Gilbert R. Brackett **May 31, 1958**

a detrimental effect on the service or causes high operating or equipment costs. When such a case shows up, it should be brought to the management's attention and a more desirable practice suggested.

The problem of providing forces each hour or half hour in order that an acceptable grade of service can be given, under good working conditions, and at an economical cost, is composed of many facets.

Some of the factors which influence these angles are the volume of traffic, units per call, switchboard equipment conditions, the size of the operator team, and the experience of the force. A continuous observation and analysis of service results, especially answer performance, must be made to ascertain the adequacy of the current hourly force on duty and to correct such conditions as may be affecting service or the provision of force.

The preparation and proper administration of force programs are essential to insure that future force needs are arrived at with a minimum effect on service, employe relations, and operating costs.

Only the general outline of force adjustment procedures can be mentioned here. Force adjustment itself is a complicated program and requires specialists to properly conduct its practices in the larger exchanges. In the smaller offices, force programs usually can be prepared to cover those months in which regular peg counts are made or changes are anticipated.

The intake of new people should be gradual so that they may be absorbed with a minimum of disturbance to the service. Of course, training classes of an economical size and the avoidance of surplus or shortage in the force have to be considered.

The subject of force adjustment has merely been touched upon here. There has been no attempt to cover its many ramifications and the details involved in its administration. The traffic engineer should have some idea of what the field covers, because it works hand in hand with the provisions of the proper number of switchboard positions and the arrangement of face equipment for the saving of operating effort, both of which spell —operating costs.

The accompanying Force Adjustment Tables can be used in estimating the effect of future board spread, team size, and experience of force on present load levels and in distributing by hours the estimated total force required on duty.

By reading the estimated number of hourly or half-hourly calls or units into the correct table, a theoretical distribution of operators is arrived at. This factor is modified for the experience of the force by periods of the day and then adjusted to the load level established for the particular board on review.

By applying judgment developed through personal observation to this distribution, the hourly or half-hourly force requirements are determined.

These tables are of little use on smaller boards where the force required is distributed by hours on the basis of personal knowledge of traffic and service conditions.

The table of Length of Service Experience Factors represents the approximate rate of progress of less experienced operators toward the average efficiency of fully experienced operators. The weighted experience factors, developed from the application of this table to a known board force, reflect the approximate load change required as the proportion of less experienced force increases or diminishes and indicate the relative effect of the experience of the morning, afternoon, and evening forces on the hourly or half-hourly theoretical distribution of force.

The number of theoretical position hours, or position half hours, required to care for a known amount of traffic for an hour or half-hour, is determined from the table as follows:

For any number of units for an hour, found in the second column, or for a half-hour, found in the first column, read the positions required opposite this figure in the column selected.

Example:—In the column for a 15 position board, opposite 1300 units for one hour, it will be seen that 7.3 position hours are required.

In case the traffic for any hour or half-hour is in excess of the traffic corresponding to the highest number of position hours shown in the column used, the requirement can be taken as the number of working positions.

When there are more working positions in an office than are shown on the table, the traffic for each hour or half-hour may be divided by two and the position requirements for this traffic obtained for a board of half the number of working positions. The figure shown, multiplied by two, will give the required position hours.

The number of theoretical position hours required for each amount of traffic shown in the table applies to any traffic from this amount up to the next higher amount shown in the table. See examples given for a 15 position board—7.3 position hours would be required for any hourly figure between 1300 and 1400 units, inclusive.

(To Be Continued Next Week)

Where can I get a

Cable Breakdown Transformer

that's easy to use, and versatile, too?

Leich answers this question with its 6B Breakdown Transformer. It clears or helps you locate cable faults easily. It offers a series of voltages to meet your various needs. It costs only $45.00.

Here's how it works. Many times you find a cable pair that's partially shorted (or grounded). In most cases a high voltage check is indicated.

When the fault is due to a small amount of moisture or some slight defect in the insulation, a flash of high voltage may clear the fault. You can apply the voltage momentarily with Leich's safer non-locking switch.

Starting at 350, the voltage can be increased to 500 or 700 volts as required.

If the fault is more serious, use of the 6B set burns the cable pair to a "solid" short. Then it's easy to locate the trouble by conventional bridge methods or tone pick-up.

This handy device is a small investment that will mean substantial savings to you in time and money. Write for our circular today.

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manufacturers of telephones, switchboards and related apparatus since 1907

Young and old were attracted to the merchandising demonstration trailer which was set up on the town square during the first half of General's Telephone Fair.

Report No. 3

On General's "Telephone Fair"

THE Telephone Fair at Washington, Ia., which began on May 1 continues to keep the interest of the Washington subscribers according to the latest report from Don L. Schumacher, director of public relations and merchandising for the General Telephone Co. of Iowa (TELEPHONY, May 24, p. 36).

He says that subscribers are responding to the promotion by continuing to purchase new service and equipment from the telephone company personnel who have been calling on homes and businesses.

The demonstration trailer, according to the report, has been taken off the square and removed to a location at the Washington exchange. At present, the trailer is no longer open to the public; however, it is being used now for special demonstrations of various equipment by the telephone solicitors to close a sale when demonstrations are desired.

Most business places have been visited and the solicitation of residence subscribers is currently under way according to Mr. Schumacher.

In discussing the sales campaign involving businesses, he reports that business subscribers were overwhelmed to find that they could obtain services such as the electronic secretaries, hands-free telephones, volume control telephones, and the other equipment that was demonstrated in the trailer. Several of these items of equipment have been sold due to the interest created by their demonstration.

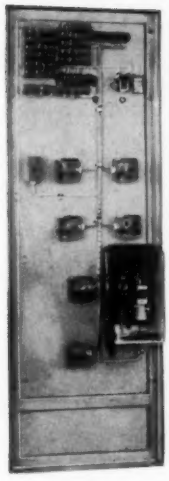
Residence subscribers are also receiving the solicitors with a very cordial reception, the report says. Thus far, there have been 85 new primary lines and extensions sold in addition to the various other equipment.

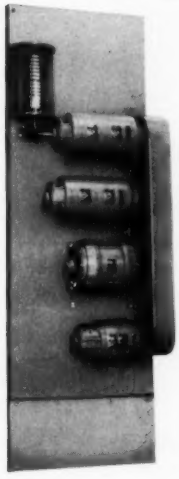
Each week a new group of solicitors is brought in so that new interest and personnel may be brought into the project. The telephone personnel who have been selected for this merchandising project report that they are enjoying this temporary change of duties. They seem to feel they are broadening their knowledge of objective selling through meeting and interviewing many different types of people and personalities.

Much interest among sales personnel is being created by the use of sales charts and quotas. Here the solicitors can each day see the progress they are making individually and collectively as each sales day ends.

The sales personnel participating in General Telephone's Washington, Ia. Telephone Fair feel that they are broadening their knowledge of objective selling through participation in this experiment. Dixie Robinson, one of the sales people working at the Fair, is shown demonstrating a color telephone. She is from the general office purchasing department, Grinnell.

ESCO RINGING EQUIPMENT





MEMBER

vertical mounting - factory prewiring saves space - simplifies installation

Here are two big points, typical of the practical considerations that go into the design of all Esco ringing equipment.

For new installations, conversions, or expanding present facilities, Esco vertical mounting, plus factory prewiring mean big savings in floor space and installation time and expense. These compact vertical assemblies fit standard rack installations for more efficient station arrangement and neat, modern appearance. Prewiring brings all exterior connections to a single terminal box for convenient connection to power and signal circuits. Color-coded lead identification is used throughout to make inspection or any later wiring changes quick and easy.

Before you make any commitments on new equipment, get the full facts on Esco vertical mounted - factory prewired assemblies. You'll see for yourself why so many equipment engineers and suppliers choose ESCO. Send for free brochure today.

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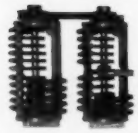

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In safety straps, Klein-Kord was the first specially woven fabric strap designed to permit the use of a tongue-type buckle without risk of slitting or ripping, even under severe strain.

Now Nylon Klein-Kord safety straps are the newest Klein development offering maximum safety with maximum flexibility. These are the only nylon straps designed to meet the tests given in Edison Electric Institute Report AP-2.

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A copy of the new Klein Pocket Tool Guide will be sent on request.

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Courts and Commissions

Texas Highway Relocation Act Challenged By Suits

The constitutionality of a 1957 Texas law which requires the state to reimburse public and private utilities for the cost of moving their facilities when necessitated by federal-aid highway construction was challenged by Texas Attorney General Will Wilson in suits filed on May 13 against the cities of Dallas and Austin and four companies. — Southwestern Bell Telephone Co., Lone Star Gas Co., Southern Union Gas Co., and Dallas Power & Light Co.

Mr. Wilson previously held in a departmental opinion that the law's provision for such reimbursements violated a section of the Texas constitution which prohibits donations of public money to any corporation or individual.

The suits alleged that the Texas Highway Department had called on Dallas and Austin, plus the utility companies, to relocate, at their own expense, utility installations on any interstate highway roads and that they (the cities and companies) refused to do so.

Instead, the cities and utility companies countered with a demand for reimbursement from the highway fund for their costs in the relocation. The highway department refused to execute such contracts.

Mountain States Asks Rate Raise In Wyoming

The Mountain States Telephone & Telegraph Co. asked the Wyoming Public Service Commission on May 12 for a rate increase.

J. V. Bradley, vice president and general manager for the company's Wyoming operations, said the company had been unable to realize the level of earnings authorized by the commission in its last order, and that present rates are producing earnings below those required to keep the business financially sound.

OK Sale; Automatic Rates For Two Kansas Companies

The Kansas Corporation Commission on May 14 authorized the Harper County Rural Telephone Association, Anthony, to take over the Geuda Springs exchange, effective as of May 19 (TELEPHONY, Apr. 26, p. 90).

The commission also allowed Nan A. Robinson to cease operation of the Geuda Springs Telephone Co. The Harper County association was told that it could charge patrons 50 cents a month in higher rates so that the exchange may be converted to automatic operation.

Among other actions, the commission granted Golden Belt Telephone Association, Inc., La Crosse, permanent automatic rates exactly the same as those charged for the past year as interim rates and collected under bond.

Telephone Electric Shock, N. J. Woman Asks Damages

Mrs. Theresa Morgan of Elizabeth, filed a $15,000 superior court suit against the New Jersey Bell Telephone Co. on May 15 for injuries she said she suffered when she allegedly received a "severe electric shock" from a telephone booth.

According to the suit, Mrs. Morgan reached into the paystation coin box to pick up a dime that had been rejected when she received the shock.

Harry Wolf, attorney for Mrs. Morgan, said that his client suffered injuries to her nervous system. The accident occurred on Aug. 6, 1957 in an Elizabeth restaurant.

SW Bell Asks Intrastate, Service Raises In Kan.

The Southwestern Bell Telephone Co. on May 19 filed an application with the Kansas Corporation Commission asking for permission to increase charges for telephone installations and for rates of some intrastate long distance service. These proposed increases would total $960,000 annually.

J. Hardin Smith, Southwestern vice president and general manager for Kansas, said that "no change is proposed in the basic charges for residence or business telephone service."

He said the requested increases are necessary if Bell is "to attract capital needed to carry out a 62 million dollar construction program planned for Kansas in 1958 and 1959."

The petition calls for increases in the service charges on collect station-to-station long distance calls, person-to-person long distance calls, over-time

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long distance calls, and for charges for changing, moving, or installing telephones.

Southwestern's application also asked for rate reductions for 13 Kansas towns. Because Chase and Nickerson have lost customers until they now have about 590, their rates would be reduced.

In 11 other communities, the exchange area would be enlarged to "reduce or eliminate mileage charges for customers in suburban areas." These include Southwest Topeka, Paola, Kansas City, Medicine Lodge, Kingman, Dodge City, Atchison, Emporia, Augusta, Lawrence, and the Temple, Plainville, Jackson and Parkview areas of Wichita.

Mr. Smith said the company's construction programs call for converting 24 communities to dial service in the next two years, and extending the network of stormproof telephone cables throughout the state. The latter, he said, would "eliminate weather interference" on long distance lines.

To carry out this program, Mr. Smith said the company will have to "secure some 40 million dollars in additional capital to finance our growth program and take care of customer demand for improved telephone service."

Mr. Smith said the $960,000 annual increase would be less than 1½ per cent of the company's gross annual revenues.

Person-to-person long distance calls in Kansas now cost 60 per cent more than station-to-station calls. This would be increased to 70 per cent if the raise is approved. For example, if a station-to-station call costs 50 cents, the person-to-person rate would go from 80 to 85 cents.

The service charge on collect station-to-station calls, which now is 5 to 15 cents on calls having a basic charge of 10 to 15 cents, would be increased to 15 to 25 cents on all such calls.

Overtime long distance rates would be computed to the nearest cent rather than to the even or next lower multiple of five cents. Mr. Smith gave this example: On a four-minute call costing 50 cents, plus 15-cents overtime, the total charge is now 65 cents. The new rate would be 50 cents for the initial period, 17 cents for overtime or a total of 67 cents.

Installation, move or change charges would be increased an amount ranging from 25 cents to $1.75. The increases would vary, Mr. Smith said, according to the work requested by the customer and would "compensate for the additional cost of labor and materials."

Emergency Party-Line Use Law Amended in R. I.

Governor Dennis J. Roberts of Rhode Island signed on May 13 an amendment bill to tighten and broaden a law making it a misdemeanor to refuse to relinquish a party telephone line in an emergency (TELEPHONY, Feb. 15, p. 33).

Under this new amendment to the law, jeopardy of human life is included as a reason a person can demand that another give up a party-line. The new measure also requires telephone companies to carry notice of the law in their directories.

Authorize Rate Increase For Oregon Independent

The Oregon Public Utility Commissioner on May 15 granted a rate increase to the Valley Telephone Co., Silverton.

The company presently operates exchanges at Silverton, Detroit, Turner, Aumsville, and Mill City. Of these exchanges, Detroit, Turner, and Silverton have been converted to automatic operation and conversion of Aumsville and Mill City is scheduled during 1959.

The gross annual revenue increase granted by the commission to the Val-

INDEPENDENT TELEPHONE COMPANY EQUITIES OFFER INTERESTING INVESTMENT OPPORTUNITIES

The current issue of INVESTMENT PLANNING reviews the fast-growing Independent Telephone Industry, and six common stocks in this group which offer both good income return and long term growth possibilities.

Not commonly known is the fact that one telephone in every seven in the U. S. is operated by an Independent Company. They are benefitting from the growth in population, and the tendency of industry to move plants to the suburbs and small towns.

The merger movement now in full swing among the Independents gives rise to many potential special situations.

This special study contains a complete list of Independent Telephone issues having active trading markets, showing the latest reported earnings, dividends, and yields.

For an up-to-date report on this Industry, and analyses of six representative common stocks, order your copy of INVESTMENT PLANNING now.

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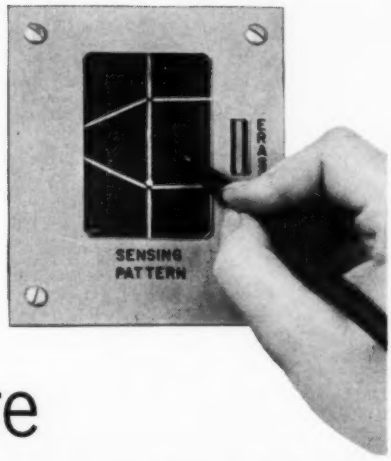

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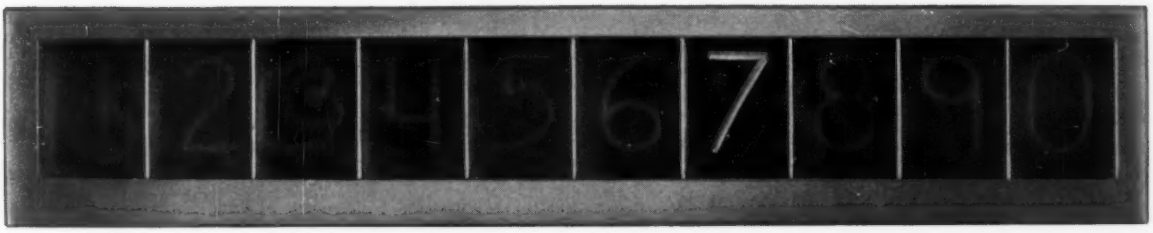


on new Bell Labs machine

A new device invented at Bell Laboratories "reads" a numeral while it is being written and instantly converts it into distinctive electric signals. The signals may be employed to make a numeral light up in a display panel, as above, or they may be sent to a computer or to a magnetic "memory" for storage.

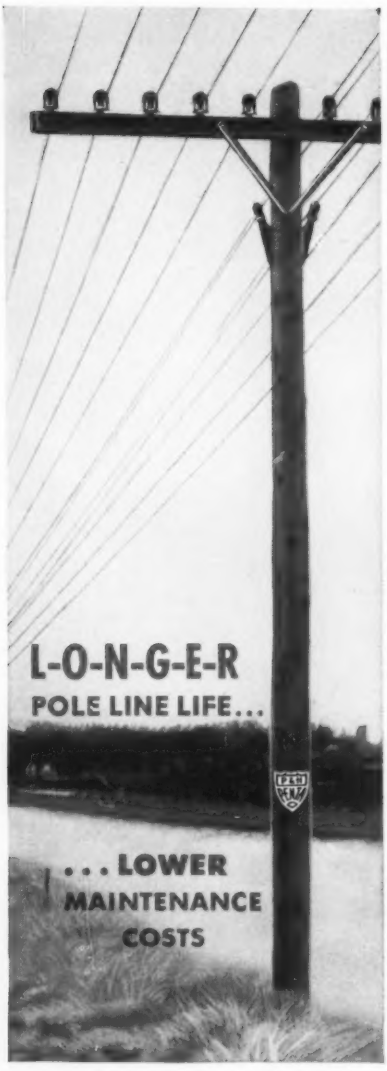
The writing is done with a metal stylus on a specially prepared surface. Two dots, one above the other, are used as reference points. Seven sensitized lines extend radially from the dots. Transistorized logic circuits recognize numerals according to which lines are crossed.

The concept of a number-reader has interesting possibilities as a new means of communication from humans to machines. For example, in an adjunct to a telephone, it might provide inexpensive means of converting handwritten data into signals which machines can read. The signals could be transmitted through the regular telephone network to a teletypewriter or computer at a distant point. In this way, a salesman might quickly and easily furnish sales data to headquarters, or a merchant might order goods from a warehouse.

Tom Dimond, a B.S. in E.E. from the University of Iowa, demonstrates an experimental model of his number-reading invention. A similar device can also be made to read alphabetical characters. Small size and low power requirements result from transistor circuitry.

Modern communication involves many more fields of inquiry than the transmission and reception of sound. The experimental number-reader is but one example of Bell Telephone Laboratories work to improve communications service.

BELL TELEPHONE LABORATORIES
World Center of Communications Research and Development



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ley company comes to $17,634.36 providing a rate of return of 5.33 per cent on a rate base composed of average net plant and working capital amounting to $741,854.73.

Rates for the Mill City, Aumsville, Detroit, and Turner exchanges are as follows, with the Aumsville and Mill City rates being effective upon conversion to automatic operation:

One-party business	$5.50
Two-party business	4.50
Ten-party business	3.50
One-party residence	4.60
Two-party residence	3.60
Four-party residence	3.00
Ten-party residence	3.00

Rates for the Silverton exchange are as follows:

	Old	*New*
One-party business	$5.25	$ 8.00
Two-party business	4.75	6.75
Ten-party business	4.50	5.50
PBX Trunks	5.25	12.00
Key System	5.25	10.00
One-party residence	3.75	5.20
Two-party residence	3.50	4.00
Four-party residence	3.25	*
Ten-party residence	3.25	*

*—No change

USITA Prepares Separations Manual

A task force under the direction of the United States Independent Telephone Association (USITA) subcommittee on message toll compensation, chairman, A. W. Lambert, recently held meetings in Washington to prepare a separations manual for Independent company use to underlie telephone message toll settlements with Bell System companies. This manual will include separation procedures following the principles set forth in the revised 1957 National Association of Railroad & Utilities Commissioners—Federal Communications Commission separations manual to the extent of their application to Independent company operation.

The draft of the new procedures being written by the task force will include a detailed analysis of all items to determine their effect on special studies of message toll telephone business interchanged with Bell System companies.

The initial task force is composed of Don Childers, United Utilities, Inc.; Richard Gabel, Rural Electrification Administration; Evert Karlsson, General Telephone Corp.; John Evans, Evans Telephone Co., Patterson, Cal.; and other representatives of the Independent industry. The task force's assignment is being coordinated by Mervin H. Alexander, USITA toll engineer. The Bell System representatives are cooperating in the work of the task force by providing information requested by the task force during the preparation of the draft.

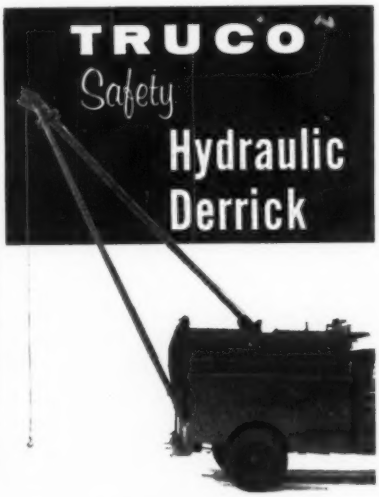
Concurrent with the work of the task force, the USITA has engaged the services of the Service Bureau Corp., a subsidiary of International Business Machines Corp., to make an analysis of methods and factors associated with settlements for message toll telephone business interchanged with the Bell System. It is felt that this analysis might provide simplification of separation procedure work by producing new indices that could be used by Independent companies for toll settlements.

Venezuela OK's 10.2 Million For Telephone Expansion

Approval of a 10.2 million dollar credit allotment for improvement of telephone service throughout Venezuela has been granted by the government, it was reported on May 12.

Announcement of the credit plan to aid the National Telephone company in extending services was made by the Ministry of Communications. The credit approval came on the heels of a government pledge to improve telephone communications which have seriously lagged behind demand in recent years.

TRUCO
Safety
Hydraulic
Derrick



- TRUCO safety Hydraulic Derrick "middle leg" allows simple, fast, safe one-man operation.
- Simple Hydraulic cylinder in "middle leg" makes Derrick a "Live" boom.
- Converts to powerful pole jack. Unique folding mechanism permits greater use of space in rear of body.

Truco
TRUCK Equipment CO.
3963 Walnut Street
Denver 5, Colorado

Recent Telephone Loans Announced By REA

The Rural Electrification Administration has approved the following rural telephone loans:

The Utelwico, Inc., Talbotton, Ga.; $45,000; May 12.

These funds will be used by the borrower primarily to serve 37 rural families in the area who were not included in prior loans, and to provide for an increase in the proportion of private and semi-private lines. In addition, a portion of the loan will be used to complete the authorized system.

A total of 498 rural subscribers will receive new and improved service as a result of the REA loans to this borrower totaling $304,000. At present over 400 of the subscribers are receiving dial service.

T. J. Battle is president and manager of The Utelwico, Inc.

•

Perry-Spencer Rural Telephone Co-op., Tell City, Ind.; $247,000; May 13.

These funds will be used by the borrower to improve service for 454 existing subscribers and to furnish initial service to 64 farm families. The subscribers who will have their service improved are now receiving magneto service from the Holland Telephone Co. and the Stendal Telephone Co. The Perry-Spencer cooperative plans to acquire these telephone facilities.

A new automatic central office to serve both areas is scheduled for construction at Holland. Approximately 1,800 rural subscribers will receive new and improved service as a result of REA loans totaling $825,000 to this borrower. The completed system will consist of five exchanges. The four exchanges now in operation serve approximately 1,175 subscribers.

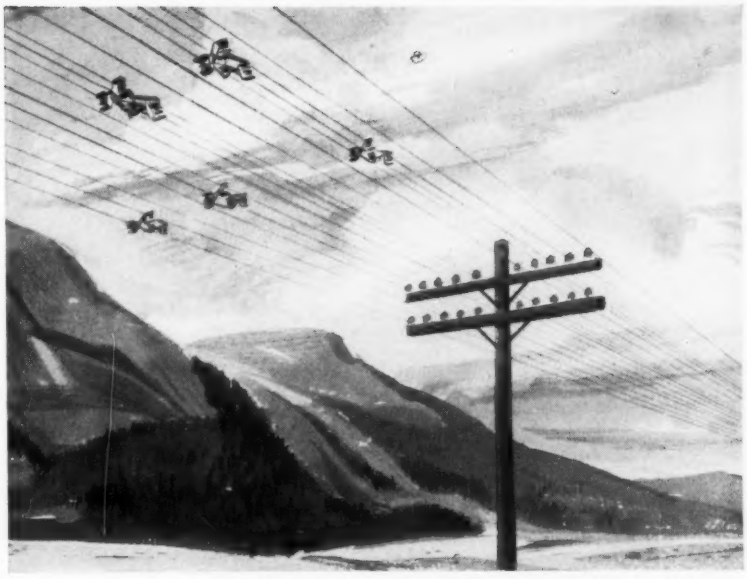
Clyde LaGrange is president of the Perry-Spencer Rural Telephone Co-op. and Norbert V. Peter is manager.

•

Texas-Midland Telephone Co., 10353 Denton Drive, Dallas; $185,000; May 13.

These funds will be used by the borrower to improve service for 186 rural subscribers and to provide initial service to 145 farm families. At present the existing subscribers are receiving magneto service from the Rosser Telephone Co. and the Scurry Telephone Co. The Texas-Midland company proposes to acquire these facilities, rehabilitate, and integrate them.

New facilities planned by the bor-



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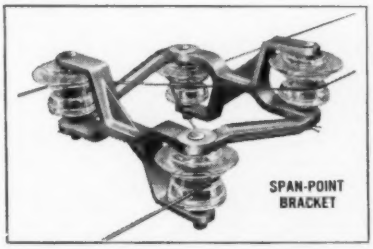

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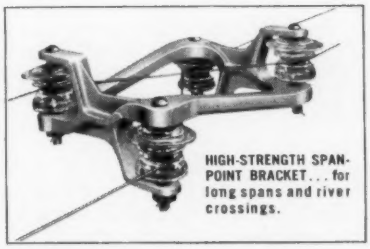

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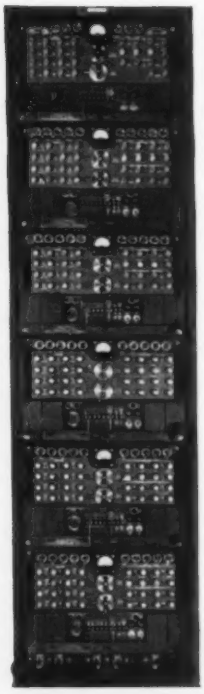

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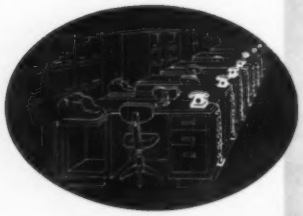

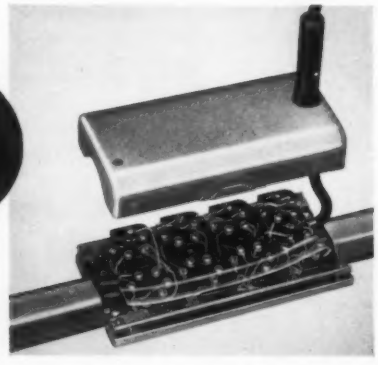

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rower include automatic central offices at Rosser and Scurry. The three REA loans to Texas-Midland amount to $558,000 which will enable it to provide new and improved service to 1,025 rural subscribers. The system will consist of automatic exchanges at Acton, Godley, Kopperl, Rosser, and Scurry.

C. J. Wimer is both president and manager of the Texas-Midland Telephone Co.

•

Vernon Telephone Co-op., Viroqua, Wis.; $403,000; May 13.

These and funds from prior loans will enable the cooperative to improve service for 596 rural subscribers and to furnish initial service to 262 farm families. The subscribers who will get improved service are now receiving magneto service from the LaFarge Telephone Co. The borrower plans to acquire, rehabilitate, and expand these facilities.

New construction scheduled includes an automatic central office at LaFarge. The three REA loans to the Vernon cooperative total $1,029,000 which will enable it to furnish new and improved service to 1,798 rural subscribers. The system, when complete, will consist of four exchanges. The Liberty Pole, Red Mound, and Romance exchanges are in operation serving approximately 600 rural subscribers.

Otto Harder is president and Robert C. Wetterlin is manager of the Vernon Telephone Co-op.

•

Plain Dealing (La.) Telephone Co.; $40,000; May 14.

The company proposes to use these funds to complete the authorized system and to provide for an increase in the proportion of private and semi-private lines.

REA loans to this borrower total $363,000 which will enable it to provide new and improved service to 733 rural subscribers. About 570 subscriber are now receiving dial service through the Plain Dealing exchange.

George L. Lee is president and manager of the Plain Dealing Telephone Co.

•

Capital Telephone Co., Hickman, Neb.; $516,000; May 16.

This new borrower, a cooperative organization, was formed in September 1957 by officials of four small local companies. Its purpose is to improve service for 878 existing subscribers and to provide initial service for 46 farm families.

As a nucleus for the new service, the borrower plans to acquire the fol-

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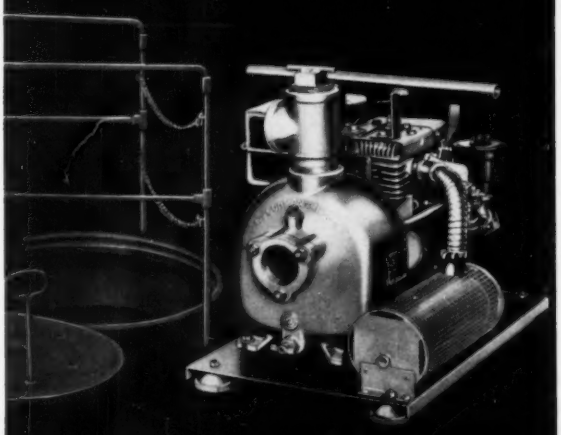

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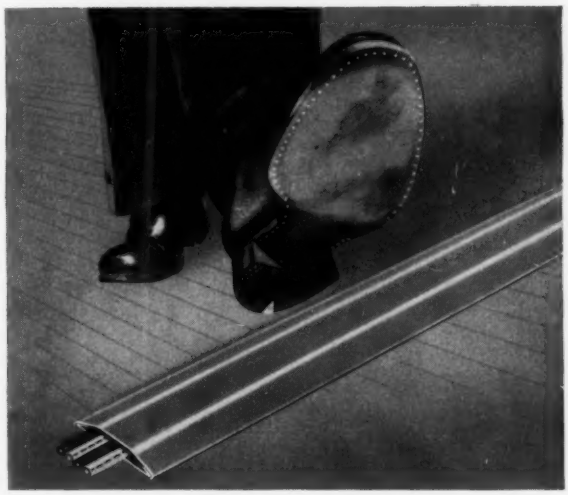

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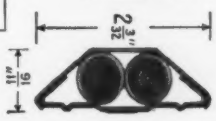

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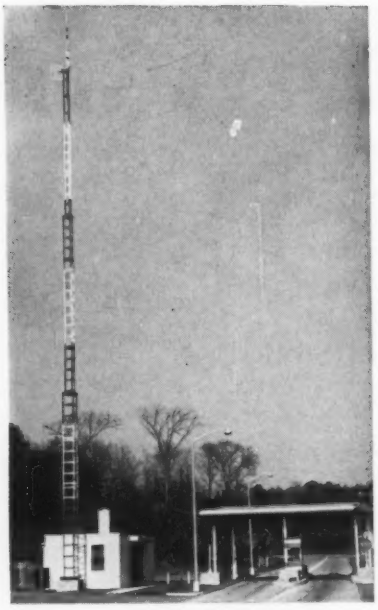

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lowing companies now providing magneto service: Cortland Telephone Co., Firth Telephone Co., Hickman Telephone Co., and the Martell Telephone Co. These facilities will be rehabilitated and integrated into one system. The borrower's present plans include new automatic central offices to replace the Cortland, Firth, Hickman and Martell magneto facilities.

Walter R. Paschold is president of the Capitol Telephone Co.

•

Arapahoe (Neb.) Telephone Co.; $389,000; May 16.

The new borrower proposes to use these funds to improve service for 828 rural subscribers and to furnish initial service to 60 farm families.

The Arapahoe company now provides magneto service to 548 of the subscribers who will receive improved service. It plans to acquire the Holbrook Central Telephone Association which furnishes magneto service to the remaining 280 subscribers. New automatic central offices are scheduled at Arapahoe and Holbrook.

John H. Koller is both president and manager of the Arapahoe Telephone Co.

Six REA Employes Receive Superior Service Awards

Awards for superior service were presented to six employes of the Rural Electrification Administration (REA) at the U. S. Department of Agriculture's honor awards ceremony held in Washington on May 27.

Employes cited for outstanding contributions to the telephone and rural electric programs were:

Reginald E. Cole, director, Southwest area, for his work in resolving power supply problems and in developing and directing improved management programs for cooperatives. Mr. Cole has been with REA since 1936.

Maynard S. Knapp, central office equipment engineer, telephone engineering division, for his performance in handling the agency's responsibilities for the technical phases of central office equipment. Mr. Knapp has been with REA for five years.

F. Berlin Shoemaker, head, rates and valuation section, telephone operations and loans division, for his initiative and skill in devising procedures for conducting rates and valuation studies. Mr. Shoemaker joined REA in 1950.

Daniel W. Teare, power use representative, North Central area, for devising and improving methods and techniques of applying electric power to the production, preparation and preservation of farm crops. Mr. Teare has been with REA since 1937.

Everett C. Weitzell, chief, telephone operations and loans division, for his accomplishments in gaining industry-wide acceptance of the rural telephone program and his valuable contributions to its steady growth and success. Mr. Weitzell went to REA in 1947.

Edward F. Wilson, assistant chief, electric operations and loans division, for his contributions to improved management activities which have made possible more effective administration of the rural electrification program. Mr. Wilson has been an REA employe since 1936.

E. H. Plaisted Retires From Pennsylvania Independent

After 48 years of continuous service with the Peoples Telephone Corp., Butler, Pa., Earl H. Plaisted, assistant manager and purchasing agent has retired as of June 1.

Mr. Plaisted got his first taste of telephone work in 1907 when he went

E. H. PLAISTED

to work for the Peoples company as a lineman but he left in the fall to join the Standard Steel Car Co. as an electrician. He returned to the Peoples company in 1910 as a cableman. He later was made an assistant wire chief and switchboard installer, moving on in 1918 to wire chief and PBX repairman.

By 1926 Mr. Plaisted had been promoted to plant superintendent. From 1926 to 1951 he was in charge of the entire operation of the plant department, supervising all outside construction of telephone facilities as well as the construction and additions to the 20 central office exchange buildings of the company. He was made assistant manager and purchasing agent in 1951.

Tex. Co-ops Plan Convention

The Texas Statewide Telephone Cooperative, Inc. will hold its convention at the Roosevelt Hotel in Waco, Texas, on Nov. 14 and 15.

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Automatic Electric Named One of Ten Top New Plants

The Automatic Electric Co. of Northlake, Ill., has been named one of the 10 best new plants built in 1957. The plant was picked from nearly 1,000 nationwide entries by *Factory Management and Maintenance*, McGraw-Hill publication.

Winners will receive a citation on which appears an original Kent Day Coes water color of their plant.

The citation for Automatic Electric, a member of General Telephone System, reads "Imaginative planning and careful execution transformed a 167-acre golf course into an idyllic site for this efficient plant. Yet, for all its size, Automatic Electric looks like—and is—a good neighbor in a residential community."

Architect-engineer-contractor was the Austin Co. of Cleveland, O.

The entries were nominated by U.S. architects and engineers, regional and state development commissions, railroads and readers of the magazine. The 10 winning plants were required to be of "general interest and significance for a broad range of plant operating executives in many types of manufacturing industries and in companies of all sizes."

Furthermore, the factories (including additions to existing plants which are intended to be separate, virtually self-contained production units) must have been all new, and must have been completed between Jan. 1, 1957, and Dec. 31, 1957.

Selection was based on adaptability to changes in production methods and processes; provisions for growth and expansion; plant electrical services; services other than electrical; employe facilities and services; maintenance, and appearance of buildings and grounds.

Neither size of the plant nor number of employes was a factor. There was no entry fee or cost to the competing companies.

N. Y. Telephone Man Injured

A. J. Bohnsack, president of the Germantown (N. Y.) Telephone Co., Inc., was seriously injured by a falling timber on Friday, May 16. He is confined in Columbia Memorial Hospital, Hudson, N. Y. While it is reported that his condition is slowly improving, he is expected to be in the hospital several weeks.

English Telephone Tongue

The Overseas Telephone Office in Toyko has direct circuits all over the world. The operators are Japanese, but the language used in setting up calls with operators in distant lands is English. Recently service was opened to Peking and to Moscow. The Chinese Communist operators and the Russians gladly and fluently use the language of Uncle Sam in their dealings with the Japanese.

Roland Whitehurst, left, vice president of The Electric Storage Battery Co., receives a $1,000 bond at a recent dinner in Philadelphia marking his 50th anniversary with the company. Presentation was made by C. F. Norberg, right, company president, who was dinner chairman. Looking on is Vice Admiral Ralph E. Wilson, deputy chief of naval operations (Logistics), main speaker who characterized Mr. Whitehurst as "Mr. Storage Battery Himself."

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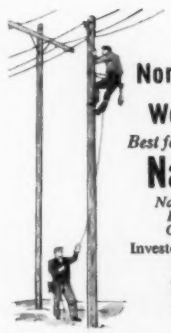

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